

(1 of 2)

PTO/SB/08A (10-01)

Approved for use through 10/31/2002. OMB 0651-0031
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

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Sheet 1 of 6

Complete If Known

Application Number	10/615,927
Filing Date	July 10, 2003
First Named Inventor	Louis B. Rosenberg
Art Unit	2675
Examiner Name	Unassigned
Attorney Docket Number	IMMR106/01US

U.S. PATENT DOCUMENTS

Examiner	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number Kind Code ² (if known)			
/RL/		6,422,941	7/23/2002	Thomer et al.	
		6,349,301	2/19/2002	Mitchell et al.	
		6,160,489	12/12/2000	Perry et al.	
		6,111,577	8/29/2000	Zilles et al.	
		5,785,630	7/28/1998	Bobick et al.	
		5,766,016	6/16/1998	Sinclair	
		5,690,582	11/25/1997	Ulrich et al.	
		5,575,761	11/19/1996	Hajianpour	
		5,547,382	8/20/1996	Yamasaki	
		5,466,213	11/14/1995	Hogan	
		5,437,607	8/1/1995	Taylor	
		5,436,622	7/25/1995	Gutman et al.	
		5,334,027	8/2/1994	Wherlock	
		5,309,140	5/3/1994	Everett	
		5,299,810	4/5/1994	Pierce	
		5,283,970	2/8/1994	Aligner	
		5,275,174	1/4/1994	Cook	
		5,271,290	12/21/1993	Fischer	
		5,240,417	8/31/1993	Smithson et al.	
		5,212,473	5/18/1993	Louis	
		5,186,695	2/16/1993	Mangseth et al.	
		5,175,459	12/29/1992	Daniat et al.	
		5,165,897	11/24/1992	Johnson	
		5,078,152	1/7/1992	Bond	
		5,038,089	8/6/1991	Szakaly	
		5,035,242	7/30/1991	Franklin	
		5,022,407	6/11/1991	Horch et al.	
		5,022,384	6/11/1991	Freels	
		5,019,761	5/28/1991	Kraft	
		4,934,694	6/19/1990	McIntosh	
		4,930,770	6/5/1990	Baker	
		4,891,764	1/2/1990	McIntosh	
		4,885,565	12/5/1989	Embach	
		4,794,392	12/27/1988	Selinko	
		4,713,007	12/15/1987	Alban	

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		4,581,491	4/8/1986	Boothroyd	
		4,513,235	4/23/1985	Acklam et al.	
		4,484,191	11/20/1984	Vavra	
		4,464,117	8/7/1984	Foerst	
		4,333,070	6/1/1982	Barnes	
		4,262,549	4/21/1981	Schwellenbach	
		4,236,325	10/2/1980	Hall et al.	
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		4,127,752	11/28/1978	Lowthorp	
		3,911,416	10/7/1995	Feder	
		3,903,614	9/9/1975	Diamond et al	
		3,902,687	6/25/1973	Hightower	
		3,623,064	11/23/1970	Kagan	
		3,517,446	6/30/1970	Corlyon et al.	
		3,497,668	2/24/1970	Hirsch	
		3,220,121	11/30/1965	Cutler	
		3,157,853	11/17/1964	Hirsch	
/RL/		2,972,140	2/14/1961	Hirsch	

Examiner Initials*	Cite No. ¹	Foreign Patent Document			Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Country Code ³	Number ⁴	Kind Code ⁵ (if known)			
/RL/		EP	0349086		1/3/1990	Stork Kwant B.V.	
		JP	H2-185278		7/19/1990	Taito Corporation	
		JP	H4-8381		1/13/1992	Epoch Co. and Key- Planning Co.	
		JP	H7-24147		1/27/1995	Sega Corporation	
/RL/		JP	H5-192449		8/3/1993	Taito Corporation	

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Sheet **3** of **6****Complete if Known**

Application Number	10/815,927
Filing Date	July 10, 2003
First Named Inventor	Louis B. Rosenberg
Art Unit	2675
Examiner Name	Unassigned
Attorney Docket Number	IMMR106/01US

OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS

Examiner Initials *	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
/RL/		BAIGRIE, "Electric Control Loading - A Low Cost, High Performance Alternative," <i>Proceedings of Interservice/Industry Training Systems Conference</i> , pp. 247-254, November 6-8, 1990.
		WATA, "Pen-based Haptic Virtual Environment," 0-7803-1363-1/93 IEEE, pp 287-292, 1993.
		RUSO, "The Design and Implementation of a Three Degree of Freedom Force Output Joystick," MIT Libraries Archives, pp. 1-131, May 1990, archived 08/14/1990.
		BROOKS et al., "Hand Controllers for Teleoperation - A State-of-the-Art Technology Survey and Evaluation," JPL Publication 85-11; NASA-CR-175890; N85-28559, pp. 1-84, 03/1/1985.
		JONES et al., "A perceptual analysis of stiffness," ISSN 0014-4819 Springer International (Springer-Verlag); <i>Experimental Brain Research</i> , Vol. 79, No. 1, pp. 150-156, 1990.
		BURDEA et al., "Distributed Virtual Force Feedback, Lecture Notes for Workshop on Force Display in Virtual Environments and Its Application to Robotic Teleoperation," 1993 IEEE International Conference on Robotics and Automation, pp. 25-44, 05/02/1993.
		SNOW et al., "Model-X Force-Reflecting-Hand-Controller," NT Control No. NPO-17851; JPL Case No. 7348, pp. 1-4, with 45 pages of attachments, 06/15/1989.
		OUH-YOUNG, "Force Display in Molecular Docking," Doctoral Dissertation, University of North Carolina at Chapel Hill, UMI Order No. 9034744, pp. 1-369, 1990.
		TADROS, "Control System Design for a Three Degree of Freedom Virtual Environment Simulator Using Motor/Brake Pair Actuators, MIT Archive, pp. 1-88, February 1990, archived 8/13/90.
		CALDWELL et al., "Enhanced Tactile Feedback (Tele-Taction) Using a Multi-Functional Sensory System," 1050-4729/93, pp. 955-960, 1993.
		ADELSTEIN, "Design and Implementation of a Force Reflecting Manipulandum for Manual Control research," DSC-Vol. 42, <i>Advances in Robotics</i> , pp. 1-12, 1992.
		GOTOW et al., "Controlled Impedance Test Apparatus for Studying Human Interpretation of Kinesthetic Feedback," WA11-11:00, pp. 332-337.
✓		STANLEY et al., "Computer Simulation of Interacting Dynamic Mechanical Systems Using Distributed Memory Parallel Processors," DSC-Vol. 42, <i>Advances in Robotics</i> , pp. 55-61, ASME 1992.
/RL/		RUSO, "Controlling Dissipative Magnetic Particle Brakes in Force Reflective Devices," DSC-Vol. 42, <i>Advances in Robotics</i> , pp. 63-70, ASME 1992.

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Sheet **4** of **6****Complete if Known**

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First Named Inventor	Louis B. Rosenberg
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Examiner Name	Unassigned
Attorney Docket Number	IMMR106/01US

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Examiner Initials *	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
/RL/		KONTARINIS et al., "Display of High-Frequency Tactile Information to Teleoperators," <i>Telemanipulator Technology and Space Telerobotics</i> , Won S. Kim, Editor, Proc. SPIE Vol. 2057, pp. 40-50, Sep. 7-9, 1993.
		PATRICK et al., "Design and Testing of A Non-reactive, Fingertip, Tactile Display for Interaction with Remote Environments," <i>Cooperative Intelligent Robotics In Space</i> , Rui J. deFigueiredo et al., Editor, Proc. SPIE Vol. 1387, pp. 215-222, 1990.
		ADELSTEIN, "A Virtual Environment System For The Study of Human Arm Tremor," <i>Ph.D. Dissertation</i> , Dept. of Mechanical Engineering, MIT, June 1989, archived 3/13/90.
		BEJCZY, "Sensors, Controls, and Man-Machine Interface for Advanced Teleoperation," <i>Science</i> , Vol. 208, No. 4450, pp. 1327-1335, 1980.
		BEJCZY et al., "Generalization of Bilateral Force-Reflecting Control of Manipulators," <i>Proceedings Of Fourth CISM-IFTOMM</i> , Sep. 8-12, 1981.
		MCAFFEE, "Teleoperator Subsystem/Telerobot Demonstrator: Force Reflecting Hand Controller Equipment Manual," <i>JPL D-5172</i> , January 1988.
		MINSKY, "Computational Haptics: The Sandpaper System for Synthesizing Texture for a Force-Feedback Display," <i>Ph.D. Dissertation</i> , MIT, June 1995, archived 7/6/95.
		JACOBSEN et al., "High Performance, Dexterous Telerobotic Manipulator With Force Reflection," <i>Intervention/ROV '91 Conference & Exposition</i> , Hollywood, Florida, May 21-23, 1991.
		SHIMOGA, "Finger Force and Touch Feedback Issues in Dexterous Telemanipulation," <i>Proceedings of Fourth Annual Conference on Intelligent Robotic Systems for Space Exploration</i> , Rensselaer Polytechnic Institute, Sep. 30 - Oct. 1, 1992.
		IBM Technical Disclosure Bulletin, "Mouse Ball-Actuating Device With Force and Tactile Feedback," Vol. 32, No. 9B, February 1990.
		TERRY et al., "Tactile Feedback In A Computer Mouse," <i>Proceedings of Fourteenth Annual Northeast Bioengineering Conference</i> , University of New Hampshire, March 10-11, 1988.
		HOWE, "A Force-Reflecting Teleoperated Hand System for the Study of Tactile Sensing In Precision Manipulation," <i>Proceedings of the 1992 IEEE International Conference on Robotics and Automation</i> , Nice, France, May 1992.
↓		EBERHARDT et al., "OMAR - A Haptic display for speech perception by deaf and deaf-blind individuals," <i>IEEE Virtual Reality Annual International Symposium</i> , Seattle, WA, Sep. 18-22, 1993.
/RL/		RABINOWITZ et al., "Multidimensional tactile displays: Identification of vibratory intensity, frequency, and contactor area," <i>Journal of The Acoustical Society of America</i> , Vol. 82, No. 4, October 1987.

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Sheet **5** of **6****Complete if Known**

Application Number	10/615,927
Filing Date	July 10, 2003
First Named Inventor	Louis B. Rosenberg
Art Unit	2675
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Attorney Docket Number	IMMR106/01US

OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS

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/RL/		BEJCZY et al., "Kinesthetic Coupling Between Operator and Remote Manipulator," <i>International Computer Technology Conference, The American Society of Mechanical Engineers</i> , San Francisco, CA, August 12-15, 1980.
		BEJCZY et al., "A Laboratory Breadboard System For Dual-Arm Teleoperation," <i>SOAR '89 Workshop</i> , JSC, Houston, TX, July 25-27, 1989.
		OUH-YOUNG, "A Low-Cost Force Feedback Joystick and Its Use in PC Video Games," <i>IEEE Transactions on Consumer Electronics</i> , Vol. 41, No. 3, August 1995.
		MARCUS, "Touch Feedback in Surgery," <i>Proceedings of Virtual Reality and Medicine The Cutting Edge</i> , Sept. 8-11, 1994.
		BEJCZY, et al., "Universal Computer Control System (UCCS) For Space Telerobots," CH2413-3/87/0000/0318501.00 1987 IEEE, 1987.
		PATRICK, "Design, Construction, and Testing of a Fingertip Tactile Display for Interaction with Virtual and Remote Environments," <i>Master of Science Thesis</i> , MIT, Aug. 1990, archived Nov. 8, 1990.
		CALDER, "Design of A Force-Feedback Touch-Introducing Actuator For Teleoperator Robot Control," <i>Bachelor of Science Thesis</i> , MIT, May 1983, archived June 23, 1983.
		WIKER, "Teletouch Display Development: Phase 1 Report," <i>Technical Report 1230</i> , Naval Ocean Systems Center, San Diego, July 1988.
		BLISS, "Optical-to-Tactile Image Conversion for the Blind," <i>IEEE Transactions on Man-Machine Systems</i> , Vol. MMS-11, No. 1, March 1970.
		JOHNSON, "Shape-Memory Alloy Tactile Feedback Actuator," <i>Armstrong Aerospace Medical Research Laboratory</i> , AAMRL-TP-90-039, August, 1990.
		KONTARINIS et al., "Tactile Display of Vibratory Information in Teleoperation and Virtual Environments," <i>PRESENCE</i> , 4(4):387-402, Harvard Univ., 1995.
		AUKSTAKALNIS et al., "Silicon Mirage: The Art and Science of Virtual Reality," ISBN 0-938151-82-7, pp. 129-180, 1992.
		EBERHARDT et al., "Inducing Dynamic Haptic Perception by The Hand: System Description and Some Results," <i>DSC-Vol. 55-1, Dynamic Systems and Control: Volume 1</i> , ASME 1994.
		GOBEL et al., "Tactile Feedback Applied to Computer Mice," <i>International Journal of Human-Computer Interaction</i> , Vol. 7, No. 1, pp. 1-24, 1995.
/RL/		PIMENTEL et al., "Virtual Reality: through the new looking glass," 2 nd Edition; McGraw-Hill, ISBN 0-07-050167-X, pp. 41-202, 1994.

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		OUHYOUNG et al., "The Development of A Low-Cost Force Feedback Joystick and Its Use in the Virtual Reality Environment," <i>Proceedings of the Third Pacific Conference on Computer Graphics and Applications, Pacific Graphics '95</i> , Seoul, Korea, 21-24 August 1995.
		KACZMAREK et al., "Tactile Displays," <i>Virtual Environment Technologies</i> , Chap. 9, pp. 349-414.
		LAKE, "Cyberman from Logitech," at http://www.ibiblio.org/GameBytes/Issue21/greviews/cyberman.html , 1994.
		"Component Maintenance Manual With Illustrated Parts List, Coaxial Control Shaker Part No. C-25502," Safe Flight Instrument Corporation, Revised 28 January 2002 (3 pages).
		"Technical Manual Overhaul Instructions With Parts Breakdown, Coaxial Control Shaker Part No. C-25502," Safe Flight Instrument Corporation, Revised 15 July 1980 (23 pages).
		SCANNELL, "Taking a Joystick Ride," <i>Computer Currents</i> , Boston Edition, Vol. 9, No. 11, November 1994
		YAMAKITA et al., "Tele-Virtual Reality of Dynamic Mechanical Model," <i>Proceedings of the 1992 IEEE/RSJ International Conference on Intelligent Robots and Systems</i> , Raleigh, NC, July 7-10, 1992
		NOLL, "Man-Machine Tactile," <i>SID Journal</i> , July/August 1972 Issue.
/RL/		ROSENBERG, "Virtual Fixtures: Perceptual Overlays Enhance Operator Performance In Telepresence Tasks," <i>Ph.D. Dissertation</i> , Stanford University, June 1994.

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		3,875,488	04/1975	Crocker et al.	
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		3,902,687	6/25/1973	Hightower	
		3,903,614	09/09/1975	Diamond et al.	
		3,919,691	11/11/1975	Noll	
		3,923,166	12/02/1975	Fletcher et al.	
		3,944,798	03/1976	Eaton	
		4,114,882	09/1978	Mau	
		4,125,800	11/14/1978	Jones	
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		4,148,014	04/1979	Burson	
		4,160,508	07/10/1979	Salsbury	
		4,216,467	08/1980	Colston	
		4,236,325	10/02/1980	Hall et al.	
		4,398,889	08/16/1983	Lam et al.	
		4,448,083	05/1984	Hayashi	
		4,477,043	10/1984	Repperger	
		4,477,973	10/1984	Davies	
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		4,550,221	10/1985	Mabusth	
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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

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Sheet **2** of **18****Complete If Known**

Application Number	10/615,927
Filing Date	July 10, 2003
First Named Inventor	Louis B. Rosenberg
Art Unit	2675
Examiner Name	Unassigned
Attorney Docket Number	IMMR106/01US

U.S. PATENT DOCUMENTS					
Examiner	Cite No. ¹	Document Number Number Kind Code ² (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
IRL		4,601,206	07/1986	Watson	
		4,603,284	07/29/1986	Perzley	
		4,604,016	08/1986	Joyce	
		4,632,341	07/1987	Repperger et al.	
		4,638,798	01/1987	Sheldon et al.	
		4,653,011	03/1987	Iwano	
		4,654,648	03/31/1987	Herrington et al.	
		4,676,002	06/1987	Slocum	
		4,679,331	12/1986	Koontz	
		4,688,983	08/1987	Lindbom	
		4,689,449	08/25/1987	Rosen	
		4,692,756	09/1987	Clark	
		4,703,443	10/1987	Moriyasu	
		4,704,909	11/1987	Grahn et al.	
		4,706,294	11/1987	Ouchida	
		4,708,656	11/24/1987	De Vries et al.	
		4,713,007	12/15/1987	Alban	
		4,734,685	03/1988	Watanabe	
		4,750,487	06/1988	Zanetti	
		4,769,763	09/1988	Trieb et al.	
		4,782,327	11/1988	Kley et al.	
		4,787,051	11/1988	Olson	
		4,791,934	12/1988	Brunnett	
		4,795,296	01/03/1989	Jau	
		4,798,919	01/1989	Miessler et al.	
		4,800,721	01/31/1989	Cemenska et al.	
		4,803,413	02/1989	Kendig et al.	
		4,811,608	03/1989	Hilton	
		4,819,195	04/1989	Bell et al.	
		4,823,634	04/25/1989	Culver	
		4,839,838	06/13/1989	LaBiche et al.	
		4,849,692	07/1989	Blood	
		4,853,874	08/01/1989	Iwamoto et al.	
IRL		4,868,549	09/19/1989	Affinito et al.	

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Sheet **3** of **18****Complete if Known**

Application Number	10/615,927
Filing Date	July 10, 2003
First Named Inventor	Louis B. Rosenberg
Art Unit	2675
Examiner Name	Unassigned
Attorney Docket Number	IMMR106/01US

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		Number Kind Code ² (if known)			
/RL/		4,879,556	11/1989	Duimel	
		4,888,538	12/19/1989	Dimitov et al.	
		4,888,877	12/1989	Enderle et al.	
		4,891,764	01/02/1990	McIntosh	
		4,891,889	01/1990	Tomelleri	
		4,896,554	01/1990	Culver	
		4,907,970	03/13/1990	Meenen, Jr.	
		4,907,973	03/1990	Hon	
		4,925,312	05/1990	Onaga et al.	
		4,930,770	06/05/1990	Baker	
		4,934,694	06/19/1990	McIntosh	
		4,935,728	06/19/1990	Kley	
		4,942,538	07/17/1990	Yuan et al.	
		4,942,545	07/1990	Sapia	
		4,945,305	07/1990	Blood	
		4,945,501	07/1990	Bell et al.	
		4,949,119	08/14/1990	Moncrief et al.	
		4,961,038	10/1990	MacMinn	
		4,961,138	10/1990	Gomiak	
		4,961,267	10/1990	Herzog	
		4,962,448	10/1990	DeMaio et al.	
		4,962,591	10/1990	Zeller et al.	
		4,982,504	01/1991	Soderberg et al.	
		4,982,618	01/1991	Culver	
		4,983,786	01/1991	Stevens et al.	
		4,983,901	01/1991	Lehmer	
		5,007,085	04/09/1991	Greanias et al.	
		5,007,300	04/16/1991	Siva	
		5,018,922	05/28/1991	Yoshinada et al.	
		5,019,761	05/28/1991	Kraft	
		5,022,407	06/11/1991	Horch et al.	
		5,035,242	07/30/1991	Franklin	
		5,038,089	08/06/1991	Szakaly	
		5,040,306	08/1991	McMurtry et al.	
/RL/		5,044,956	09/03/1991	Behensky et al.	
Examiner Signature	/Regina Liang/			Date Considered	12/05/2007

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Sheet **4** of **18****Complete if Known**

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Filing Date	July 10, 2003
First Named Inventor	Louis B. Rosenberg
Art Unit	2675
Examiner Name	Unassigned
Attorney Docket Number	IMMR106/01US

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/RL/		5,050,608	09/29/1991	Watanabe et al.	
		5,065,145	11/1991	Purcell	
		5,072,361	12/10/1991	Davis et al.	
		5,076,517	12/1991	Ferranti et al.	
		5,078,152	010/7/1992	Bond	
		5,080,377	01/14/1992	Stamper et al.	
		5,088,046	02/1992	McMurtry et al.	
		5,088,055	02/1992	Oyama	
		5,095,303	03/1992	Clark et al.	
		5,103,404	04/07/1992	McIntosh	
		5,107,080	04/21/1992	Rosen	
		5,107,262	04/1992	Cadoz et al.	
		5,116,051	05/28/1992	Moncrief et al.	
		5,116,180	05/1992	Fung et al.	
		5,126,948	06/1992	Mitchell et al.	
		5,128,671	07/07/1992	Thomas Jr.	
		5,131,844	07/1992	Marinaccio et al.	
		5,132,672	07/21/1992	Clark	
		5,139,261	08/18/1992	Openiano	
		5,142,506	08/1992	Edwards	
		5,142,931	09/01/1992	Menahem	
		5,143,505	09/01/1992	Burdea et al.	
		5,146,566	09/08/1992	Hollis, Jr. et al.	
		5,148,377	09/1992	McDonald	
		5,178,012	01/1993	Culp	
		5,181,181	01/19/1993	Glynn	
		5,182,557	01/1993	Lang	
		5,184,306	02/1993	Edman et al.	
		5,184,319	02/02/1993	Kramer	
		5,185,561	02/09/1993	Good et al.	
		5,186,629	02/1993	Rohen	
		5,186,695	02/16/1993	Mangseth et al.	
		5,187,874	02/1993	Takahashi et al.	
/RL/		5,189,355	02/1993	Larkins et al.	

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Sheet 5 of 18

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Application Number	10/615,927
Filing Date	July 10, 2003
First Named Inventor	Louis B. Rosenberg
Art Unit	2675
Examiner Name	Unassigned
Attorney Docket Number	IMMR106/01US

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		Number Kind Code ² (# known)			
/RL/		5,189,806	03/1993	McMurtry et al.	
		5,193,963	03/16/1993	McAfee et al.	
		5,195,179	03/1993	Tokunaga	
		5,197,003	03/1993	Moncrief et al.	
		5,203,563	04/1993	Loper, III	
		5,204,824	04/1993	Fujimaki	
		5,209,131	05/1993	Baxter	
		5,212,473	5/18/1993	Louis	
		5,220,260	06/15/1993	Schuler	
		5,223,776	06/29/1993	Radke et al.	
		5,228,356	07/1993	Chuang	
		5,230,623	07/27/1993	Guthrie et al.	
		5,235,868	08/17/1993	Culver	
		5,235,868	08/1993	Culver	
		5,240,417	8/31/1993	Smithson et al.	
		5,243,266	09/07/1993	Kasagami et al.	
		5,251,127	10/1993	Raab	
		5,251,156	10/1993	Heier et al.	
		5,259,120	11/1993	Chapman et al.	
		5,259,894	11/1993	Sampson	
		5,262,777	11/1993	Low et al.	
		5,264,768	11/23/1993	Gregory et al.	
		5,266,875	11/30/1993	Slotine et al.	
		5,271,290	12/21/1993	Fischer	
		5,275,174	01/04/1994	Cook	
		5,275,565	01/04/1994	Moncrief	
		5,286,203	02/1994	Fuller, et al.	
		5,289,273	02/22/1994	Lang	
		5,296,846	03/1994	Ledley	
		5,296,871	03/1994	Paley	
		5,298,890	03/1994	Kanamaru et al.	
		5,299,810	04/05/1994	Pierce	
		5,309,140	05/03/1994	Everett	
/RL/		5,313,230	05/1994	Venolia et al.	

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Sheet 6 of 18

Complete if Known

Application Number	10/615,927
Filing Date	July 10, 2003
First Named Inventor	Louis B. Rosenberg
Art Unit	2675
Examiner Name	Unassigned
Attorney Docket Number	IMMR106/01US

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/RL/		5,334,027	08/02/1994	Wherlock	
		5,341,459	08/23/1994	Backes	
		5,351,692	10/1994	Dow et al.	
		5,354,162	10/11/1994	Burdea et al.	
		5,355,148	10/1994	Anderson	
		5,374,942	12/1994	Gilligan et al.	
		5,379,663	01/1995	Hara	
		5,381,080	01/1995	Schnell et al.	
		5,384,460	01/1995	Tseng	
		5,386,507	01/1995	Teig et al.	
		5,389,865	02/14/1995	Jacobus et al.	
		5,396,266	03/07/1995	Brimhall	
		5,396,267	03/07/1995	Bouton	
		5,397,323	03/1995	Taylor et al.	
		5,402,582	04/1995	Raab	
		5,405,152	04/11/1995	Katanics et al.	
		5,412,880	05/1995	Raab	
		5,414,337	05/09/1995	Schuler	
		5,417,696	05/1995	Kashuba et al.	
		5,428,748	06/27/1995	Davidson et al.	
		5,429,140	07/04/1995	Burdea et al.	
		5,435,554	07/25/1995	Lipson	
		5,436,542	07/25/1995	Petelin et al.	
		5,436,638	07/25/1995	Bolas et al.	
		5,436,640	07/1995	Reeves	
		5,445,166	08/1995	Taylor	
		5,451,924	09/19/1995	Massimino et al.	
		5,459,382	10/17/1995	Jacobus et al.	
		5,466,213	11/14/1995	Hogan	
		5,467,763	11/1995	McMahon et al.	
		5,471,571	11/1995	Smith et al.	
		5,482,051	01/1996	Reddy et al.	
		5,512,919	04/30/1996	Araki	
/RL/		5,513,100	04/30/1996	Parker et al.	

Examiner Signature	/Regina Liang/	Date Considered	12/05/2007
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First Named Inventor	Louis B. Rosenberg
Art Unit	2675
Examiner Name	Unassigned
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		Number Kind Code ² (if known)			
/RL/		5,526,480	06/1996	Gibson	
		5,530,455	06/1996	Gillick et al.	
		5,547,382	08/20/1996	Yamasaki	
		5,550,562	08/27/1996	Aoki et al.	
		5,551,701	09/03/1996	Bouton et al.	
		5,565,840	10/1996	Thomer et al.	
		5,565,887	10/1996	McCambridge et al.	
		5,565,888	10/1996	Selker	
		5,570,111	10/1996	Barrett et al.	
		5,576,727	11/19/1996	Rosenberg et al.	
		5,577,981	11/26/1996	Jarvik	
		5,583,407	12/1996	Yamaguchi	
		5,583,478	12/1996	Renzl	
		5,588,257	12/17/1996	Perfman	
		5,587,937	12/24/1996	Massie et al.	
		5,589,828	12/31/1996	Armstrong	
		5,589,854	12/31/1996	Tsai	
		5,591,924	01/1997	Hilton	
		5,596,347	01/1997	Robertson et al.	
		5,619,180	04/1997	Massimino et al.	
		5,623,582	04/22/1997	Rosenberg	
		5,623,642	04/22/1997	Katz et al.	
		5,625,576	04/29/1997	Massie et al.	
		5,629,594	05/1997	Jacobus et al.	
		5,629,597	05/1997	Jacobus, et al.	
		5,631,861	05/1997	Kramer	
		5,642,469	06/24/1997	Hannaford et al.	
		5,643,087	07/01/1997	Marcus et al.	
		5,656,901	08/1997	Kurita	
		5,666,138	09/09/1997	Culver	
		5,666,473	09/09/1997	Wallace	
		5,690,582	11/25/1997	Ulrich et al.	
		5,691,747	11/1997	Amano	
/RL/		5,691,898	11/25/1997	Rosenberg et al.	

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Sheet 8 of 18

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First Named Inventor	Louis B. Rosenberg
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Examiner Name	Unassigned
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		5,701,140	12/1997	Rosenberg et al.	
		5,709,219	01/20/1998	Chen et al.	
		5,714,978	02/03/1998	Yamanaka et al.	
		5,721,566	02/24/1998	Rosenberg et al.	
		5,724,068	03/1998	Sanchez et al.	
		5,731,804	03/1998	Rosenberg	
		5,734,373	03/31/1998	Rosenberg et al.	
		5,736,978	04/07/1998	Hasser et al.	
		5,739,811	04/1998	Rosenberg et al.	
		5,742,278	04/21/1998	Chen et al.	
		5,745,715	04/1998	Pickover et al.	
		5,754,023	05/19/1998	Roston et al.	
		5,755,577	05/26/1998	Gillio	
		5,757,358	05/1998	Osga	
		5,760,764	06/1998	Martinelli	
		5,766,016	6/16/1998	Sinclair	
		5,767,839	06/16/1998	Rosenberg	
		5,769,640	06/23/1998	Jacobus et al.	
		5,771,037	06/23/1998	Jackson	
		5,781,172	07/14/1998	Engel et al.	
		5,784,052	07/1998	Keyson	
		5,785,630	07/28/1998	Bobick et al.	
		5,786,818	07/1998	Brewer et al.	
		5,790,108	08/04/1998	Salcudean et al.	
		5,791,992	08/11/1998	Crump et al.	
		5,802,353	09/01/1998	Avila et al.	
		5,805,140	09/08/1998	Rosenberg et al.	
		5,805,165	09/1998	Thorne, III et al.	
		5,808,601	09/1998	Leah et al.	
		5,818,423	10/1998	Pugliese et al.	
		5,825,308	10/1998	Rosenberg	
		5,831,408	11/03/1998	Jacobus et al.	
/RL/		5,844,392	12/01/1998	Peurach et al.	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)		Application Number	10/615,927
		Filing Date	July 10, 2003
		First Named Inventor	Louis B. Rosenberg
		Art Unit	2675
		Examiner Name	Unassigned
Sheet 9 of 18	Attorney Docket Number	IMMR106/01US	

U.S. PATENT DOCUMENTS						
Examiner	Cite No. ¹	Document Number		Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number	Kind Code ² (if known)			
IRL		5,877,748		03/1999	Redlich	
↓		5,880,714		03/1999	Rosenberg et al.	
		5,884,029		03/16/1999	Brush, II et al.	
		5,889,670		03/30/1999	Schuler et al.	
		5,889,672		03/1999	Schuler et al.	
		5,956,484		09/21/1999	Rosenberg et al.	
		5,990,869		11/23/1999	Kubica et al.	
		6,004,134		12/21/1999	Marcus et al.	
		6,020,876		02/2000	Rosenberg et al.	
		6,028,593		02/2000	Rosenberg et al.	
		6,057,828		05/2000	Rosenberg et al.	
		6,061,004		05/2000	Rosenberg	
		6,078,308		06/2000	Rosenberg et al.	
		6,088,017		07/11/2000	Tremblay et al.	
		6,088,019		07/2000	Rosenberg	
		6,101,530		08/08/2000	Rosenberg et al.	
		6,111,577		08/29/2000	Zilles et al.	
		6,125,385		09/26/2000	Wies et al.	
		6,131,097		10/10/2000	Peurach et al.	
	↓		6,161,126		12/12/2000	Wies et al.
		6,162,123		12/2000	Woolston	
IRI		5,422,941		07/23/2002	Thomer et al.	

Examiner Initials*	Cite No. ¹	Foreign Patent Document			Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
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/RL/		WO	WO9520788		08/03/1995		
		WO	WO9502801		01/26/1995		
		UK	2254911A		10/21/1992		
		WO	WO9622591		07/25/1996		
		WO	WO9616397		05/30/1996		
		EP	0085518 A1		08/10/1983		
		WO	WO9642078		12/27/1996		
		WO	WO9532459		11/30/1995		
/RL/		WO	WO9712337		04/03/1997		

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First Named Inventor	Louis B. Rosenberg
Art Unit	2675
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Attorney Docket Number	IMMR106/01US

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Sheet	10	of	18
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/RL/		WO	WO9712357		04/03/1997			
↓		WO	WO9719440		05/25/1997			
		WO	WO9731333		08/28/1997			
		WO	WO9721160		06/12/1997			
		EP	0265011	A1	04/1988			
		EP	0607580	A1	07/1994			
		EP	0626634		05/1994			
		WO	WO9520787		08/1995			
		WO	WO9502233		01/1995			
		WO	WO9510080		04/1995			
		Japan	4-34610		02/1992			
	/RL/		EP	EP0349086		01/03/1990		

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OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS

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/RL/		"Foot-Operated Mouse," IBM Technical Disclosure Bulletin, Apr. 1986, vol. 28, No. 11.
		"High Performance Model of the Immersion Probe," Immersion-Probe-MD™, Immersion Human Interface Corporation.
		"Proceedings of the IFIP Congress 65," International Federation for Information Processing, Information Processing 1965, vol. 3, New York, May 24-29, pp. 506.
		"The Personal Digitizer™," Immersion Human Interface Corporation 1994.
		"Useful Technology for Your Idea File," Design News, Mar. 7 1994, pp. 63.
		3D Human Interface Tool, Immersion Probe™, Immersion Human Interface Corporation 1994.
		SLOCUM, Precision Machine Design, , Prentice Hall, pp. 661, 664.
		Cursor Walso, "Designer's Corner-Useful Technology for Your Idea File." Design News, Mar. 7, 1993, p. 63
		IBM Technical Disclosure Bulletin, "Mouse Ball-Actuating Device With Force and Tactile Feedback," Vol. 32, No. 9B, February 1990.
		ADACHI, YOSHITAKA et al., "Sensory Evaluation of Virtual Push-Buttons," Technical Research Center, Suzuki Motor Corporation, November 1994.
		ADELSTEIN, "A Virtual Environment System For The Study of Human Arm Tremor," Ph.D. Dissertation, Dept. of Mechanical Engineering, MIT, June 1989.
		ADELSTEIN, BERNARD D. et al., "A High Performance Two Degree-of-Freedom Kinesthetic Interface," Massachusetts Institute of Technology 1992, pp. 108-112.
		ADELSTEIN, BERNARD D. et al., "Design and Implementation of a Force Reflecting Manipulandum for Manual Control Research," 1992, pp. 1-24.
↓		AKAMATSU, M. et al., "Multimodal Mouse: A Mouse-Type Device with Tactile and Force Display," Presence, Vol. 3, No. 1, Winter 1994, pp. 73-80.
/RL/		ALBERS, F. GERRY, "Microcomputer Base for Control Loading," Naval Training Equipment Center 11 th NTEC-Industry Conference Proceedings, NAVTRAEQUIPCENT IH-306, 1978.

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Sheet 12

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Application Number 10/615,927

Filing Date July 10, 2003

First Named Inventor Louis B. Rosenberg

Art Unit 2675

Examiner Name Unassigned

Attorney Docket Number IMMR106/01US

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/RL/		ANSLEY, D., "Thimble gets in touch with reality," New Scientist, 1994, p.19.
		ATKINSON, WILLIAM D. et al., "Computing with Feeling," Comput. & Graphics, vol. 2, No. 2-E, pp. 97-103.
		BAIGRIE, "Electric Control Loading – A Low Cost, High Performance Alternative," Proceedings, pp. 247-254, November 6-8, 1990.
		BATTER, JAMES J. et al., "Grove-1: A Computer Display to the Sense of Feel," pp. TA-4-188-TA-4-192.
		BEJCZY, ANTAL K., "The Phantom Robot: Predictive Displays for Teleoperation with Time Delay," IEEE 1990, pp. 548-550.
		BEJCZY, "Sensors, Controls, and Man-Machine Interface for Advanced Teleoperation," Science, Vol. 208, No. 4450, pp. 1327-1335, 1980.
		BEJCZY, "Generalization of Bilateral Force-Reflecting Control of Manipulators," Proceedings of Fourth CISM-IFTOMM, Sep. 8-12, 1981.
		BEJCZY et al., "Kinesthetic Coupling Between Operator and Remote Manipulator," International Computer Technology Conference, The American Society of Mechanical Engineers, San Francisco, CA, August 12-15, 1980.
		BEJCZY et al., "A Laboratory Breadboard System For Dual-Arm Teleoperation," SOAR '89 Workshop, JSC, Houston, TX, July 25-27, 1989.
		BEJCZY, et al., "Tele-Virtual Reality of Dynamic Mechanical Model," Proceedings of the 1992 IEEE/RSJ International Conference on Intelligent Robots and Systems, Raleigh, NC, July 7-10, 1992.
		BROOKS, JR., F., et al., "Project GROPE-Haptic Displays for Scientific Visualization," Computer Graphics, vol. 24, Number 4, Aug., 1990, pp. 177-185.
		BROOKS et al., "Hand Controllers for Teleoperation – A State-of-the-Art Technology Survey and Evaluation," JPL Publication 85-11; NASA-CR-175890; N85-28559, pp. 1-84, 03/1/1985.
		BURDEA, GRIGORE et al., "A Portable Dextrous Master with Force Feedback," Presence: Teleoperators and Virtual Environments, MIT Press, June 1991.
↓		BURDEA, GRIGORE et al., "Distributed Virtual Force Feedback, Lecture Notes for Workshop on Force Display in Virtual Environments and its Application to Robotic Teleoperation," 1993 IEEE International Conference on Robotics and Automation, May 2, 1993, pp. 25-44.
/RL/		BURDEA, GRIGORE, et al., "Dextrous Telerobotics with Force Feedback-An Overview," Robotica 1991, Vol. 9.

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Filing Date	July 10, 2003
First Named Inventor	Louis B. Rosenberg
Art Unit	2675
Examiner Name	Unassigned
Attorney Docket Number	IMMR106/01US

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/RL/		BUTTOLO, PIETRO et al., "Pen-Based Force Display for Precision Manipulation in Virtual Environments," IEEE March 1995, pp. 1-8.
		CALDWELL, et al., "Enhanced Tactile Feedback (Tele-Taction) Using a Multi-Functional Sensory System," 1050-4729/93, pp. 955-960, 1993.
		COLGATE, J. EDWARD et al., "Implementation of Stiff Virtual Walls in Force-Reflecting Interfaces," September 22, 1993, pp. 1-9..
		EBERHARDT et al., "OMAR – A Haptic display for speech perception by deaf and deaf-blind individuals," IEEE Virtual Reality Annual International Symposium, Seattle, WA, Sep. 18-22, 1993.
		ELLIS, R.E. et al., "Design and Evaluation of a High-Performance Prototype Planar Haptic Interface," ASME December 3, 1993, DSC-Vol. 49, pp. 55-64.
		FISCHER, PATRICK et al., "Specification and Design of Input Devices for Teleoperation," 1990.
		FISHER, S.S. et al., "Virtual Environment Display System," ACM Interactive 3D Graphics, October, 1986.
		GOSSWEILER et al., "An Introduced Tutorial for Developing Multi-User Virtual Environments," Presence: Teleoperators and Virtual Environments, MIT Press, 3(4), Fall 94 pp. 255-264.
		GOTOW, J.K., et al., "Perception of Mechanical Properties at the Man-Machine Interface," IEEE 1987, pp. 688-689.
		GOTOW et al., "Controlled Impedance Test Apparatus for Studying Human Interpretation of Kinesthetic Feedback," WA11-11:00, pp. 332-337.
		HANNAFORD, B. et al., "Force Feedback Cursor Control," NASA Tech Brief, Vol. 13, No. 11, Item #21, 1989, pp. 1-4.
		HANNAFORD, BLAKE et al., "Performance Evaluation of a Six-Axis Generalized Force-Reflecting Teleoperator," IEEE May/June 1991, Vol. 21, No. 3, pp. 620-633.
		HASSER, CHRISTOPHER JOHN, "Tactile Feedback for a Force-Reflecting Haptic Display," The School of Engineering, University of Dayton, December 1995, pp. iii-xii & 1-96.
↓		HERNDON, J.N. et al., "The State-of-the-Art Model M-2 Maintenance System," Proc. of the 1984 Natl Meeting on Robotics and Remote Handling in Hostile Environments, American Nuclear Society, 1984, pp. 59-65.
/RL/		HIROTA, K., et al., "Development of Surface Display," IEEE 0-7803-1363-1, 1993, pp. 256-262.
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/RL/		HOWE, ROBERT D., "Task Performance with a Dextrous Teleoperated Hand System," Proceedings of SPIE, November 1992, Vol. 1833, pp. 1-9.	
		HOWE, "A Force-Reflecting Teleoperated Hand System for the Study of Tactile Sensing in Precision Manipulation," Proceedings of the 1992 IEEE International Conference on Robotics and Automation, Nice, France, May 1992.	
		IWATA, HIROO et al., "Volume Haptization," IEEE 1993, pp. 16-18.	
		IWATA, HIROO, "Artificial Reality with Force-Feedback: Development of Desktop Virtual Space with Compact Master Manipulator," Computer Graphics, Vol. 24, No. 4, 1990, pp. 165-170.	
		IWATA, HIROO, "Pen-based Haptic Virtual Environment," Institute of Engineering Mechanics, University of Tsukuba, Japan, pp. 287-292.	
		JACOBSEN, S.C. et al., "High Performance, High Dexterity, Force Reflective Teleoperator II," ANS Topical Meeting on Robotics & Remote Systems, Albuquerque, New Mexico February 24-27, 1991, pp. 1-10.	
		JONES, L.A., et al., "A Perceptual Analysis of Stiffness," Experimental Brain Research, Vol. 79, No. 1, pp. 150-156, 1990.	
		KELLEY, A. J. et al., "MagicMouse: Tactile and Kinesthetic Feedback in the Human-Computer Interface using an Electromagnetically Actuated Input/Output Device," Dept. of Elec. Eng., Univ. of Brit. Columbia, 1993, pp. 1-27.	
		KELLEY, A. J. et al., "On the Development of a Force-Feedback Mouse and its Integration into a Graphical User Interface," Symp. On Haptic Interfaces for Virtual Environment and Teleoperator Systems, 1994 Int'l Mechanical Engineering Congress and Exhibition, Chicago, IL, Nov. 1994, pp. 1-8.	
		KILPATRICK, P., "The use of a Kinesthetic Supplement in an Interactive Graphics System," University of North Carolina, 1976, pp. 1-175.	
		KIM, WON S. et al., "A Teleoperation Training Simulator with Visual and Kinesthetic Force Virtual Reality."	
		KIM, WON S. et al., "Graphics Displays for Operator Aid in Telemanipulation," IEEE 1991, pp. 1059-1067.	
		KONTARINIS et al., "Display of High-Frequency Tactile Information to Teleoperators," Telemanipulator Technology and Space Telerobotics, Won S. Kim, Editor, Proc. SPIE Vol. 2057, pp. 40-50, Sep. 7-9, 1993.	
		KOTOKU, TETSUO et al., "Environment Modeling for the Interactive Display (EMID) Used in Telerobotic Systems," IEEE November 3-5, 1991, pp. 99-1004.	
/RL/		KOTOKU, TETSUO, "A Predictive Display with Force Feedback and its Application to Remote Manipulation System with Transmission Time Delay," IEEE 1992, 1992, pp. 239-246.	
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/RL/		KRISHNA ROY, "Virtual Presence Takes Surgeons through the Virtual Keyhole to Hone Their Skills", Business & Industry, Jul. 4, 1995.	
		KRUEGER, MYRON W., Artificial Reality 1988, pp. 54-75.	
		McAFFEE, DOUGLAS A., "Teleoperator System/Telerobot Demonstrator: Force Reflecting Hand Controller Equipment Manual," JPL D-5172, pp. 1-50, A1-A36, B1-B5, C1-C36, January 1988.	
		MARCUS, "Touch Feedback in Surgery," Proceedings of Virtual Reality and Medicine The Cutting Edge, Sep. 8-11, 1994.	
		MEYER, KENNETH et al., "A Survey of Position Trackers," The Massachusetts Institute of Technology 1992, Presence, vol. 1, No. 2.	
		MILLMAN, P. et al., "Design of a Four-Degree-of-Freedom Force-Reflecting Manipulandum with a Specified Force/Torque Workspace," IEEE CH2969-4, 1991, pp. 1488-1493.	
		MINSKY, MARGARET et al., "Feeling and Seeing: Issues in Force Display," ACM 1990, pp. 235-242.	
		MINSKY, "Computational Haptics: The Sandpaper System for Synthesizing Texture for a Force-Feedback Display," Ph.D. Dissertation, MIT, June 1995.	
		MUNCH, S. et al., "Intelligent Control for Haptic Displays," Eurographics '96, Vol. 15, No. 3, Eurographics Association, 1996, pp. C217-C226.	
		NOLL, A. MICHAEL, "Man-Machine Tactile Communication Dissertation," Polytechnic Institute of Brooklyn, June 1971, pp. 1-88.	
		NOLL, "Man-Machine Tactile," SID Journal, July/August 1972 Issue.	
		OUH-YOUNG, MING et al., "Creating an Illusion of Feel: Control Issues in Force Display," University of North Carolina, 1989, pp. 1-14.	
		OUH-YOUNG, MING et al., "Force Display Performs Better than Visual Display in a Simple 6-D Docking Task," IEEE 1989, pp. 1462-1466.	
↓		OUH-YOUNG, MING et al., "Using a Manipulator for Force Display in Molecular Docking," IEEE 1988, pp. 1824-1829.	
/RL/		OUH-YOUNG, MING, "Force Display in Molecular Docking," Chapel Hill 1990, p. 1-369.	
Examiner Signature	/Regina Liang/		Date Considered 12/05/2007

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Substitute for form 1449A/PTO		Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)		Application Number	10/615,927
		Filing Date	July 10, 2003
		First Named Inventor	Louis B. Rosenberg
		Art Unit	2675
		Examiner Name	Unassigned
Sheet 16 of 18	Attorney Docket Number	IMMR106/01US	

OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS			
Examiner Initials *	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	
/RL/		OUH-YOUNG, "A Low-Cost Force Feedback Joystick and Its Use in PC Video Games," IEEE Transactions on Consumer Electronics, Vol. 41, No. 3, August 1995.	
		PATRICK et al., "Design and Testing of a Non-reactive, Fingertip, Tactile Display for Interaction with Remote Environments," Cooperative Intelligent Robotics in Space, Rui J. deFigueiredo et al., Editor, Proc. SPIE Vol. 1387, pp. 215-222, 1990.	
		PAYETTE, J. et al., "Evaluation of a Force Feedback (Haptic) Computer Pointing Device in Zero Gravity," DSC-Vol. 58, Proc. of ASME Dynamics Systems, ASME 1996, pp. 547-553.	
		RABINOWITZ et al., "Multidimensional tactile displays: Identification of vibratory intensity, frequency, and contactor area," Journal of The Acoustical Society of America, Vol. 82, No. 4, October 1987.	
		RAMSTEIN et al., "The Pantograph: A large Workspace Haptic Device for a Multimodal Human-Computer Interaction," Computer-Human Interaction, CHI '94, pp. 1-3.	
		RAMSTEIN, C., "Combining Haptic and Braille Technologies: Design Issues and Pilot Study," ASSETS '96, ACM 0-89791-776-6, 1996, pp. 37-44.	
		REPPERGER, D.W., "Active Force Reflection Devices in Teleoperation," IEEE Control Systems.	
		ROSENBERG, LOUIS, Ph.D., "Using Force Feedback to Enhance Human performance in Graphical User Interfaces," Apr. 1896.	
		ROSENBERG et al., "Commercially Viable Force Feedback Controller for Individuals with Neuromotor Disabilities," Crew Systems Directorate, AL/CF-TR-1997-0016, 1996, pp. 1-33.	
		ROSENBERG et al., "The use of force feedback to enhance graphical user interfaces," Stereoscopic Displays and Virtual Reality Systems III, 1996, pp. 243-248.	
		ROSENBERG, L., "Virtual Fixtures: Perceptual Overlays Enhance Operator Performance in Telepresence Tasks", Stanford University, Jun. 1994, pp. 1-214.	
		ROSENBERG, LOUIS B. et al. "Perceptual Decomposition of Virtual Haptic Surfaces," IEEE, October 1993.	
		ROSENBERG, LOUIS B., "Perceptual Design of a Virtual Rigid Surface Contact," Center for Design Research Stanford University, Air Force Material Command, April 1993, pp. 1-41.	
↓		ROSENBERG, LOUIS B., "The Use of Virtual Fixtures as Perceptual Overlays to Enhance Operator Performance in Remote Environments," Air Force Material Command, September 1992, pp. 1-42.	
/RL/		ROSENBERG, LOUIS B., "The Use of Virtual Fixtures to Enhance Operator Performance in Time Delayed Teleoperation," Armstrong Laboratory, March 1993, pp. 1-45.	
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Sheet 17 of 18

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/RL/		ROSENBERG, LOUIS B., "Virtual Fixtures as Tools to Enhance Operator Performance in Telepresence Environments," SPIE Telemanipulator Technology, 1993.
		ROSENBERG, LOUIS B., "Virtual Haptic Overlays Enhance Performance in Telepresence Tasks," SPIE, 1994.
		ROSENBERG, LOUIS B., "Crew Systems Directorate Biodynamics and Biocommunications Division Wright-Patterson, Air Force Material Command, Mar. 1993, pp. 1-45.
		RUSSO, MASSIMO ANDREA, "The Design and Implementation of a Three Degree-of-Freedom Force Output Joystick," Department of Mechanical Engineering, May 11, 1990, pp. 9-40 & 96 & 97.
		RUSSO, "Controlling Dissipative Magnetic Particle Brakes in Force Reflective Devices," DSC-Vol. 42, Advances in Robotics, pp. 63-70, ASME 1992.
		SCHMULDT, BRIAN et al., "Application Areas for a Force-Feedback Joystick," ASME 1993, DSC-Vol. 49, pp. 47-54.
		SHIMOGA, "Finger Force and Touch Feedback Issues in Dexterous Telemanipulation," Proceedings of Fourth Annual Conference on Intelligent Robotic Systems for Space Exploration, Rensselaer Polytechnic Institute, Sep. 30 – Oct. 1, 1992.
		SMITH, GEOFFREY, "Call It Palpable Progress," Business Week, Oct. 9, 1995, p. 93, 96.
		SNOW, et al., "Model-X Force-Reflecting-Hand-Controller," NT Control No. MPO-17851; JPL Case No. 5348, pp. 1-4, 06/15/1989.
		SNOW, E. et al., "Compact Force-Reflecting Hand Controller," JPL, Apr. 1991, vol. 15, No. 3, Item No. 153, pp. 1-15a.
		STANLEY et al., "Computer Simulation of Interacting Dynamic Mechanical Systems Using Distributed Memory Parallel Processors," DSC-Vol. 42, Advances in Robotics, pp. 55-61, ASME 1992.
		SU, S. AUGUSTINE et al., "The Virtual Panel Architecture: A 3D Gesture Framework," IEEE 1993, pp. 387-393.
		TADROS, "Control System Design for a Three Degree of Freedom Virtual Environment Simulator Using Motor/Brake Pair Actuators, MIT Archive, pp. 1-88, February 1990.
✓		TAN, HONG Z et al., "Manual Resolution of Compliance When Work and Force Cues are Minimized," ASME 1993, DSC-vol. 49, pp. 99-104.
/RL/		TAN, HONG Z. et al., "Human Factors for the Design of Force-Reflecting Haptic Interfaces," Tan, Srinivasan, Eberman, & Chang, ASME WAM 1994, pp. 1-11.

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		Art Unit	2675
		Examiner Name	Unassigned
		Attorney Docket Number	IMMR106/01US
Sheet	18	of	18

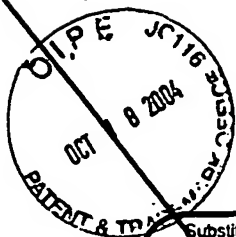
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/RL/		TAVKHELIDZE, D.S. "Kinematic Analysis of Five-Link Spherical Mechanisms, Mechanism and Machine Theory 1974, vol. 9, pp. 181-190.	
		TERRY et al., "Tactile Feedback In A Computer Mouse," Proceedings of Fourteenth Annual Northeast Bioengineering Conference, University of New Hampshire, March 10-11, 1988.	
		WIKER, S. et al., "Development of Tactile Mice for Blind Access to Computers: Importance of Stimulation Locus, Object Size, and Vibrotactile Display Resolution," Proc. of the Human Factors Society 35 th Annual Meeting 1991, pp. 708-712.	
		WINEY III, C. ALVIN McCOY, "Computer Simulated Visual and Tactile Feedback as an Aid to Manipulator and Vehicle Control," Mstr of Science in Mechanical Engineering, MIT Jun. 1981, pp. 1-80.	
↓		YAMAKITA, M. et al., "Tele-Virtual Reality of Dynamic Mechanical Model, Proceedings of the 1992 IEEE/RSJ International Conference on Intelligent Robots and Systems, Raleigh, NC, July 7-10, 1992, pp. 1103-1110.	
/RL/		YOKOKOHJI et al., "What You Can See Is What You Can Feel - Development of a Visual/Haptic Interface to Virtual Environment," Proceedings of VRAIS '96, IEEE 1996, pp. 46-54.	

Examiner Signature	/Regina Liang/	Date Considered	12/05/2007
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STATEMENT BY APPLICANT**

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Sheet **1** of **6****Complete if Known**

Application Number	10/615,927
Filing Date	July 10, 2003
First Named Inventor	Louis B. Rosenberg
Art Unit	2675
Examiner Name	Unassigned
Attorney Docket Number	IMMR106/01US

U.S. PATENT DOCUMENTS

Examiner	Cite No. ¹	Document Number		Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number	Kind Code ² (if known)			
		6,422,341		7/23/2002	Thomer et al.	
		6,349,301		2/19/2002	Mitchell et al.	
		6,160,489		12/12/2000	Perry et al.	
		6,111,577		8/29/2000	Zilles et al.	
		5,785,630		7/28/1998	Bobick et al.	
		5,766,016		6/16/1998	Sinclair	
		5,690,582		11/25/1997	Ulrich et al.	
		5,575,761		11/19/1996	Hajianpour	
		5,547,382		8/20/1996	Yamasaki	
		5,466,213		11/14/1995	Hogan	
		5,437,607		8/1/1995	Taylor	
		5,436,622		7/25/1995	Gutman et al.	
		5,334,027		8/2/1994	Wherlock	
		5,309,140		5/3/1994	Everett	
		5,299,810		4/5/1994	Pierce	
		5,283,970		2/8/1994	Aigner	
		5,275,174		1/4/1994	Cook	
		5,271,290		12/21/1993	Fischer	
		5,240,417		8/31/1993	Smithson et al.	
		5,212,473		5/18/1993	Louis	
		5,186,695		2/16/1993	Mangseth et al.	
		5,175,459		12/29/1992	Daniel et al.	
		5,165,897		11/24/1992	Johnson	
		5,078,152		1/7/1992	Bond	
		5,038,089		8/6/1991	Szakaly	
		5,035,262		7/30/1991	Franklin	
		5,022,407		6/11/1991	Horch et al.	
		5,022,384		6/11/1991	Freels	
		5,019,761		5/28/1991	Kraft	
		4,934,694		6/19/1990	McIntosh	
		4,930,770		6/5/1990	Baker	
		4,891,764		1/2/1990	McIntosh	
		4,885,565		12/5/1989	Embach	
		4,794,392		12/27/1988	Selinko	
		4,713,007		12/15/1987	Alban	

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STATEMENT BY APPLICANT**

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Sheet **2** of **6****Complete If Known**

Application Number	10/615,927
Filing Date	July 10, 2003
First Named Inventor	Louis B. Rosenberg
Art Unit	2675
Examiner Name	Unassigned
Attorney Docket Number	IMMR106/01US

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		4,708,856	11/24/1987	De Vries et al.	
		4,599,076	7/8/1986	Hladky et al.	
		4,581,491	4/8/1986	Boothroyd	
		4,513,235	4/23/1985	Acklam et al.	
		4,484,191	11/20/1984	Vavra	
		4,464,117	8/7/1984	Joerst	
		4,333,070	6/1/1982	Barnes	
		4,262,549	4/21/1981	Schwellenbach	
		4,236,325	10/2/1980	Hall et al.	
		4,160,508	7/10/1979	Salsbury	
		4,127,752	11/28/1978	Lowthorp	
		3,911,416	10/7/1995	Feder	
		3,903,614	9/9/1975	Diamond et al.	
		3,902,687	6/25/1973	Hightower	
		3,623,064	11/23/1970	Kagan	
		3,517,446	6/30/1970	Corlyon et al.	
		3,497,668	2/24/1970	Hirsch	
		3,220,121	11/30/1965	Cutler	
		3,157,853	11/17/1964	Hirsch	
		2,972,140	2/14/1961	Hirsch	

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		Country Code ³	Number	Kind Code ⁴ (if known)			
		EP	0349086		1/3/1990	Stork Kwant B.V.	
		JP	H2-185278		7/19/1990	Taito Corporation	
		JP	H4-8381		1/13/1992	Epoch Co. and Key- Planning Co.	
		JP	H7-24147		1/27/1995	Sega Corporation	
		JP	H5-192449		8/3/1993	Taito Corporation	

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		BAIGRIE, "Electric Control Loading - A Low Cost, High Performance Alternative," <i>Proceedings of Interservice/Industry Training Systems Conference</i> , pp. 247-254, November 6-8, 1990.
		IWATA, "Pen-based Haptic Virtual Environment," 0-7803-1363-1/93 IEEE, pp. 287-292, 1993.
		RUSO, "The Design and Implementation of a Three Degree of Freedom Force Output Joystick," MIT Libraries Archives, pp. 1-131, May 1990, archived 08/14/1990.
		BROOKS et al., "Hand Controllers for Teleoperation - A State-of-the-Art Technology Survey and Evaluation," JPL Publication 85-11; NASA-CR-175890; N85-28559, pp. 1-84, 02/11/1985.
		JONES et al., "A perceptual analysis of stiffness," ISSN 0014-4819 Springer International (Springer-Verlag); <i>Experimental Brain Research</i> , Vol. 79, No. 1, pp. 150-155, 1990.
		BURDEA et al., "Distributed Virtual Force Feedback/Lecture Notes for Workshop on Force Display in Virtual Environments and Its Application to Robotic Teleoperation," 1993 IEEE International Conference on Robotics and Automation, pp. 25-44, 05/02/1993.
		SNOW et al., "Model-X Force-Reflecting-Hand-Controller," NT Control No. NPO-17851; JPL Case No. 7348, pp. 1-4, with 45 pages of attachments, 06/15/1989.
		OUH-YOUNG, "Force Display in Molecular Docking," Doctoral Dissertation, University of North Carolina at Chapel Hill, UMI Order No. 9034744, pp. 1-269, 1990.
		TADROS, "Control System Design for a Three Degree of Freedom Virtual Environment Simulator Using Motor/Brake Pair Actuators, MIT Archive, pp. 1-88, February 1990, archived 8/13/90.
		CALDWELL et al., "Enhanced Tactile Feedback (Tele-Taction) Using a Multi-Functional Sensory System," 1050-4729/93, pp. 955-960, 1993.
		ADELSTEIN, "Design and Implementation of a Force Reflecting Manipulandum for Manual Control research," DSC-Vol. 42, <i>Advances in Robotics</i> , pp. 1-12, 1992.
		GOTOW et al., "Controlled Impedance Test Apparatus for Studying Human Interpretation of Kinesthetic Feedback," WA11-11:00, pp. 332-337.
		STANLEY et al., "Computer Simulation of Interacting Dynamic Mechanical Systems Using Distributed Memory Parallel Processors," DSC-Vol. 42, <i>Advances in Robotics</i> , pp. 55-61, ASME 1992.
		RUSO, "Controlling Dissipative Magnetic Particle Brakes in Force Reflective Devices," DSC-Vol. 42, <i>Advances in Robotics</i> , pp. 63-70, ASME 1992.

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		KONTARINIS et al., "Display of High-Frequency Tactile Information to Teleoperators," <i>Telemanipulator Technology and Space Telerobotics</i> , Won S. Kim, Editor, Proc. SPIE Vol. 2057, pp. 40-50, Sep. 7-9, 1993.
		PATRICK et al., "Design and Testing of A Non-reactive, Fingertip, Tactile Display for Interaction with Remote Environments," <i>Cooperative Intelligent Robotics In Space</i> , Rui J. deFigueiredo et al., Editor, Proc. SPIE Vol. 1387, pp. 215-222, 1990.
		ADELSTEIN, "A Virtual Environment System For The Study of Human Arm Tremor," <i>Ph.D. Dissertation</i> , Dept. of Mechanical Engineering, MIT, June 1989, archived 3/13/90.
		BEJCZY, "Sensors, Controls, and Man-Machine Interface for Advanced Teleoperation," <i>Science</i> , Vol. 208, No. 4450, pp. 1327-1335, 1980.
		BEJCZY et al., "Generalization of Bilateral Force-Reflecting Control of Manipulators," <i>Proceedings Of Fourth CISM-IFTOMM</i> , Sep. 8-12, 1981.
		MC AFFEE, "Teleoperator Subsystem/Telerobot Demonstration: Force Reflecting Hand Controller Equipment Manual," <i>JPL D-5172</i> , January 1988.
		MINSKY, "Computational Haptics: The Sandpaper System for Synthesizing Texture for a Force-Feedback Display," <i>Ph.D. Dissertation</i> , MIT, June 1995, archived 7/6/95.
		JACOBSEN et al., "High Performance, Dexterous Telerobotic Manipulator With Force Reflection," <i>Intervention/ROV '91 Conference & Exposition</i> , Hollywood, Florida, May 21-23, 1991.
		SHIMOGA, "Finger Force and Touch Feedback Issues in Dexterous Telemanipulation," <i>Proceedings of Fourth Annual Conference on Intelligent Robotic Systems for Space Exploration</i> , Rensselaer Polytechnic Institute, Sep. 30 - Oct. 1, 1992.
		IBM Technical Disclosure Bulletin, "Mouse Ball-Actuating Device With Force and Tactile Feedback," Vol. 32, No. 9B, February 1990.
		TERRY et al., "Tactile Feedback In A Computer Mouse," <i>Proceedings of Fourteenth Annual Northeast Bioengineering Conference</i> , University of New Hampshire, March 10-11, 1988.
		HOWE, "A Force-Reflecting Teleoperated Hand System for the Study of Tactile Sensing in Precision Manipulation," <i>Proceedings of the 1992 IEEE International Conference on Robotics and Automation</i> , Nice, France, May 1992.
		EBERHARDT et al., "OMAR - A Haptic display for speech perception by deaf and deaf-blind individuals," <i>IEEE Virtual Reality Annual International Symposium</i> , Seattle, WA, Sep. 18-22, 1993.
		RABINOWITZ et al., "Multidimensional tactile displays: Identification of vibratory intensity, frequency, and contactor area," <i>Journal of The Acoustical Society of America</i> , Vol. 82, No. 4, October 1987.

Examiner
SignatureDate
Considered

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STATEMENT BY APPLICANT**

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Sheet **5** of **6****Complete if Known**

Application Number	10/615,927
Filing Date	July 10, 2003
First Named Inventor	Louis B. Rosenberg
Art Unit	2675
Examiner Name	Unassigned
Attorney Docket Number	IMMR106/01US

OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS

Examiner Initials *	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
		BEJCZY et al., "Kinesthetic Coupling Between Operator and Remote Manipulator," <i>International Computer Technology Conference, The American Society of Mechanical Engineers</i> , San Francisco, CA, August 12-15, 1980.
		BEJCZY et al., "A Laboratory Breadboard System For Dual-Arm Teleoperation," <i>SOAR '89 Workshop</i> , JSC, Houston, TX, July 25-27, 1989.
		OUH-YOUNG, "A Low-Cost Force Feedback Joystick and Its Use in PC Video Games," <i>IEEE Transactions on Consumer Electronics</i> , Vol. 41, No. 3, August 1995.
		MARCUS, "Touch Feedback in Surgery," <i>Proceedings of Virtual Reality and Medicine The Cutting Edge</i> , Sept. 8-11, 1994.
		BEJCZY, et al., "Universal Computer Control System (UCCS) For Space Telerobots," CH2413-3/87/0000/0318501.00 1987 IEEE, 1987.
		PATRICK, "Design, Construction, and Testing of a Fingertip Tactile Display for Interaction with Virtual and Remote Environments," <i>Master of Science Thesis</i> , MIT, Aug. 1990, archived Nov. 8, 1990.
		CALDER, "Design of A Force-Feedback Touch-Introducing Actuator For Teleoperator Robot Control," <i>Bachelor of Science Thesis</i> , MIT, May 1983, archived June 23, 1983.
		WIKER, "Teletouch Display Development: Phase 1 Report," <i>Technical Report 1230</i> , Naval Ocean Systems Center, San Diego, July 1988.
		BLISS, "Optical-to-Tactile Image Conversion for the Blind," <i>IEEE Transactions on Man-Machine Systems</i> , Vol. MMS-11, No. 1, March 1970.
		JOHNSON, "Shape-Memory Alloy Tactile Feedback Actuator," <i>Armstrong Aerospace Medical Research Laboratory</i> , AAMRL-TR-90-039, August, 1990.
		KONTARINIS et al., "Tactile Display of Vibratory Information in Teleoperation and Virtual Environments," <i>PRESENCE</i> , 4(4):387-402, Harvard Univ., 1995.
		AUKSTAKALNIS et al., "Silicon Mirage: The Art and Science of Virtual Reality," ISBN 0-988151-82-7, pp. 129-180, 1992.
		EBERHARDT et al., "Inducing Dynamic Haptic Perception by The Hand: System Description and Some Results," <i>DSC Vol. 55-1, Dynamic Systems and Control</i> , Volume 1, ASME 1994.
		BOBEL et al., "Tactile Feedback Applied to Computer Mice," <i>International Journal of Human-Computer Interaction</i> , Vol. 7, No. 1, pp. 1-24, 1995.
		PIMENTEL et al., "Virtual Reality: through the new looking glass," 2 nd Edition; McGraw-Hill, ISBN 0-07-050187-X, pp. 41-202, 1994.

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Sheet 6 of 6

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Application Number	10/615,927
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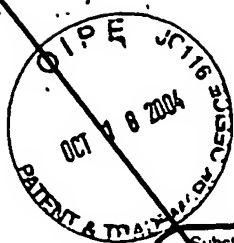
Examiner Initials *	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
		"Cyberman Technical Specification," Logitech Cyberman SWIFT Supplement to Logitech Mouse Technical Reference and Programming Guide, 4/5/1994.
		OUHYOUNG et al., "The Development of A Low-Cost Force Feedback Joystick and Its Use in the Virtual Reality Environment," <i>Proceedings of the Third Pacific Conference on Computer Graphics and Applications, Pacific Graphics '95</i> , Seoul, Korea, 21-24 August 1995.
		KACZMAREK et al., "Tactile Displays," <i>Virtual Environment Technologies</i> , Chap. 9, pp. 349-414.
		LAKE, "Cyberman from Logitech," at http://www.ibiblio.org/GameBytes/issue21/greviews/cyberman.html , 1994.
		"Component Maintenance Manual With Illustrated Parts List, Coaxial Control Shaker Part No. C-25502," Safe Flight Instrument Corporation, Revised 28 January 2002 (3 pages).
		"Technical Manual Overhaul Instructions With Parts Breakdown, Coaxial Control Shaker Part No. C-25502," Safe Flight Instrument Corporation, Revised 15 July 1980 (23 pages).
		SCANNELL, "Taking a Joystick Ride," <i>Computer Currents</i> , Boston Edition, Vol. 9, No. 11, November 1994
		YAMAKITA et al., "Tele-Virtual Reality of Dynamic Mechanical Model," <i>Proceedings of the 1992 IEEE/RSJ International Conference on Intelligent Robots and Systems</i> , Raleigh, NC, July 7-10, 1992
		NOLL, "Man-Machine Tactile," <i>SID Journal</i> , July/August 1972 issue.
		ROSENBERG, "Virtual Figures: Perceptual Overlays Enhance Operator Performance In Telepresence Tasks," <i>Ph.D. Dissertation</i> , Stanford University, June 1994.

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Sheet 1 of 18

Complete if Known

Application Number	10/615,927
Filing Date	July 10, 2003
First Named Inventor	Louis B. Rosenberg
Art Unit	2675
Examiner Name	Unassigned
Attorney Docket Number	IMMR106/01US

U.S. PATENT DOCUMENTS

Examiner	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number Kind Code ² (if known)			
		2,906,179	09/1959	Bower	
		3,157,853	11/17/1964	Hirsch	
		3,220,121	11/30/1965	Cutler	
		3,490,059	01/1970	Paulsen et al.	
		3,497,668	2/24/1970	Hirsch	
		3,517,446	06/30/1970	Canyon et al.	
		3,531,868	10/1970	Stevenson	
		3,795,150	03/1974	Eckhardt	
		3,875,488	04/1975	Crocker et al.	
		3,890,958	06/1975	Fister et al.	
		3,902,687	6/25/1973	Hightower	
		3,903,614	09/09/1975	Diamond et al.	
		3,919,691	11/11/1975	Noll	
		3,923,166	12/02/1975	Fletcher et al.	
		3,944,798	03/1976	Eaton	
		4,114,882	07/1978	Mau	
		4,125,800	11/14/1978	Jones	
		4,131,033	12/1978	Wright et al.	
		4,148,014	04/1979	Burson	
		4,160,508	07/10/1979	Salsbury	
		4,216,467	08/1980	Colston	
		4,236,325	10/02/1980	Hall et al.	
		4,398,889	08/16/1983	Lam et al.	
		4,448,083	05/1984	Hayashi	
		4,477,043	10/1984	Repperger	
		4,477,973	10/1984	Davies	
		4,513,235	04/23/1985	Acklam et al.	
		4,550,221	10/1985	Mabuth	
		4,550,617	11/1985	Fraignier et al.	
		4,560,983	12/1985	Williams	
		4,571,834	02/1986	Fraser et al.	
		4,581,491	04/08/1986	Boothroyd	
		4,593,470	06/1986	Davies	
		4,599,070	07/08/1986	Hladky et al.	

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Sheet **2** of **18****Complete if Known**

Application Number	10/615,927
Filing Date	July 10, 2003
First Named Inventor	Louis B. Rosenberg
Art Unit	2675
Examiner Name	Unassigned
Attorney Docket Number	IMMR106/01US

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		4,601,206	07/1986	Watson	
		4,603,284	07/29/1986	Perzley	
		4,604,016	08/1986	Joyce	
		4,632,341	07/1987	Repperger et al.	
		4,638,798	01/1987	Sheldon et al.	
		4,653,011	03/1987	Iwano	
		4,654,648	03/31/1987	Herrington et al.	
		4,676,002	08/1987	Slocum	
		4,679,331	12/1986	Koontz	
		4,688,983	08/1987	Lindbom	
		4,689,449	08/25/1987	Rosen	
		4,692,756	09/1987	Clark	
		4,703,443	10/1987	Moriyasu	
		4,704,909	11/1987	Grahn et al.	
		4,706,294	11/1987	Ouchida	
		4,708,656	11/24/1987	De Vries et al.	
		4,713,007	12/15/1987	Alban	
		4,734,685	03/1988	Watanabe	
		4,750,487	06/1988	Zanetti	
		4,769,763	09/1988	Grieb et al.	
		4,782,327	11/1988	Klay et al.	
		4,787,051	11/1988	Olsen	
		4,791,934	12/1988	Brunner	
		4,795,296	01/03/1989	Jau	
		4,798,919	01/1989	Miessler et al.	
		4,800,721	01/31/1989	Cemenska et al.	
		4,803,413	02/1989	Kendig et al.	
		4,811,608	03/1989	Hilton	
		4,819,195	04/1989	Bell et al.	
		4,823,634	04/25/1989	Culver	
		4,839,838	06/13/1989	LaBiche et al.	
		4,849,692	07/1989	Blood	
		4,853,874	08/01/1989	Iwamoto et al.	
		4,868,549	09/19/1989	Affinito et al.	

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Sheet **3** of **18****Complete if Known**

Application Number	10/615,927
Filing Date	July 10, 2003
First Named Inventor	Louis B. Rosenberg
Art Unit	2675
Examiner Name	Unassigned
Attorney Docket Number	IMMR106/01US

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		Number	Kind Code ² (if known)			
		4,879,556		11/1989	Dulmel	
		4,888,538		12/19/1989	Dimitov et al.	
		4,888,877		12/1989	Enderle et al.	
		4,891,764		010/2/1990	McIntosh	
		4,891,889		01/1990	Tortelleri	
		4,896,554		01/1990	Culver	
		4,907,970		03/13/1990	Meenen, Jr.	
		4,907,973		03/1990	Hon	
		4,925,312		05/1990	Onaga et al.	
		4,930,770		06/05/1990	Baker	
		4,934,694		06/19/1990	McIntosh	
		4,935,728		06/19/1990	Kley	
		4,942,538		07/17/1990	Yuan et al.	
		4,942,545		07/1990	Sapia	
		4,945,305		07/1990	Blood	
		4,945,501		07/1990	Bell et al.	
		4,949,119		08/14/1990	Moncrief et al.	
		4,961,038		10/1990	MacMinn	
		4,961,138		10/1990	Gorniak	
		4,961,267		10/1990	Herzog	
		4,962,448		10/1990	DeMaio et al.	
		4,962,591		10/1990	Zeller et al.	
		4,982,504		01/1991	Soderberg et al.	
		4,982,618		01/1991	Culver	
		4,983,786		01/1991	Stevens et al.	
		4,983,901		01/1991	Lehmer	
		5,007,085		04/09/1991	Greanias et al.	
		5,007,300		04/16/1991	Siva	
		5,018,922		05/28/1991	Yoshinada et al.	
		5,019,761		05/28/1991	Kraft	
		5,022,407		06/11/1991	Horch et al.	
		5,035,242		07/30/1991	Franklin	
		5,038,089		08/06/1991	Szakaly	
		5,040,306		08/1991	McMurtry et al.	
		5,044,956		09/03/1991	Behensky et al.	
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Sheet **4** of **18****Complete if Known**

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Art Unit	2675
Examiner Name	Unassigned
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		5,050,608	09/29/1991	Watanabe et al.	
		5,065,145	11/1991	Purcell	
		5,072,361	12/10/1991	Davis et al.	
		5,076,517	12/1991	Ferranti et al.	
		5,078,152	01/07/1992	Bond	
		5,080,377	01/14/1992	Stamper et al.	
		5,088,046	02/1992	McMurtry et al.	
		5,088,055	02/1992	Oyama	
		5,095,303	03/1992	Clark et al.	
		5,103,404	04/07/1992	McIntosh	
		5,107,080	04/21/1992	Rosen	
		5,107,262	04/1992	Cadoz et al.	
		5,116,051	05/26/1992	Moncrief et al.	
		5,118,180	05/1992	Fung et al.	
		5,126,948	06/1992	Mitchell et al.	
		5,128,671	07/07/1992	Thomas Jr.	
		5,131,844	07/1992	Marinaccio et al.	
		5,132,672	07/21/1992	Clark	
		5,139,261	08/18/1992	Openiano	
		5,142,506	08/1992	Edwards	
		5,142,931	09/01/1992	Menahem	
		5,143,505	09/01/1992	Burden et al.	
		5,146,566	09/08/1992	Hollis, Jr. et al.	
		5,148,377	09/1992	McDonald	
		5,178,012	01/1993	Culp	
		5,181,181	01/19/1993	Glynn	
		5,182,557	01/1993	Lang	
		5,184,306	02/1993	Edman et al.	
		5,184,319	02/02/1993	Kramer	
		5,185,561	02/09/1993	Good et al.	
		5,186,629	02/1993	Rohen	
		5,186,695	02/16/1993	Mangseth et al.	
		5,187,874	02/1993	Takahashi et al.	
		5,189,355	02/1993	Larkins et al.	

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Sheet 5 of 18

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		5,189,806		03/1993	McMurtry et al.	
		5,193,963		03/16/1993	McAfee et al.	
		5,195,179		03/1993	Tokunaga	
		5,197,003		03/1993	Moncrief et al.	
		5,203,563		04/1993	Loper, III	
		5,204,824		04/1993	Fujimaki	
		5,209,131		05/1993	Baxter	
		5,212,473		5/18/1993	Louis	
		5,220,260		06/15/1993	Schuler	
		5,223,776		06/29/1993	Radke et al.	
		5,228,356		07/1993	Chuang	
		5,230,623		07/27/1993	Guthrie et al.	
		5,235,868		08/17/1993	Culver	
		5,235,868		08/1993	Culver	
		5,240,417		8/31/1993	Smithson et al.	
		5,243,266		09/07/1993	Kasagami et al.	
		5,251,127		10/1993	Raab	
		5,251,156		10/1993	Heier et al.	
		5,259,120		11/1993	Chapman et al.	
		5,259,894		11/1993	Sampson	
		5,262,777		11/1993	Low et al.	
		5,264,768		11/23/1993	Gregory et al.	
		5,266,875		11/30/1993	Slotine et al.	
		5,271,290		12/21/1993	Fischer	
		5,275,174		01/04/1994	Cook	
		5,275,565		01/04/1994	Moncrief	
		5,286,203		02/1994	Fuller, et al.	
		5,289,273		02/22/1994	Lang	
		5,296,846		03/1994	Ledley	
		5,296,871		03/1994	Paley	
		5,298,890		03/1994	Kanamaru et al.	
		5,299,810		04/05/1994	Pierce	
		5,309,140		05/03/1994	Everett	
		5,313,230		05/1994	Venolla et al.	

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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

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Sheet **6** of **18****Complete if Known**

Application Number	10/615,927
Filing Date	July 10, 2003
First Named Inventor	Louis B. Rosenberg
Art Unit	2675
Examiner Name	Unassigned
Attorney Docket Number	IMMR106/01US

U.S. PATENT DOCUMENTS

Examiner	Cite No. ¹	Document Number Number Kind Code ² (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		5,334,027	08/02/1994	Wherlock	
		5,341,459	08/23/1994	Backes	
		5,351,692	10/1994	Dow et al.	
		5,354,162	10/11/1994	Burdea et al.	
		5,355,148	10/1994	Anderson	
		5,374,942	12/1994	Gilligan et al.	
		5,379,663	01/1995	Hara	
		5,381,080	01/1995	Schnell et al.	
		5,384,460	01/1995	Tseng	
		5,386,507	01/1995	Teig et al.	
		5,389,865	02/14/1995	Jacobus et al.	
		5,396,266	03/07/1995	Brimhall	
		5,396,267	03/07/1995	Bouton	
		5,397,323	03/1995	Taylor et al.	
		5,402,582	04/1995	Raab	
		5,405,152	04/11/1995	Katanics et al.	
		5,412,880	05/1995	Raab	
		5,414,337	05/09/1995	Schuler	
		5,417,696	05/1995	Kashuba et al.	
		5,428,748	06/27/1995	Davidson et al.	
		5,429,140	07/04/1995	Burdea et al.	
		5,435,554	07/25/1995	Lipson	
		5,438,542	07/25/1995	Petelin et al.	
		5,436,638	07/25/1995	Bolas et al.	
		5,436,640	07/1995	Reeves	
		5,445,166	08/1995	Taylor	
		5,451,924	09/19/1995	Massimino et al.	
		5,459,382	10/17/1995	Jacobus et al.	
		5,466,273	11/14/1995	Hogan	
		5,467,763	11/1995	McMahon et al.	
		5,471,571	11/1995	Smith et al.	
		5,482,051	01/1996	Reddy et al.	
		5,512,919	04/30/1996	Araki	
		5,513,100	04/30/1996	Parker et al.	

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Sheet 7 of 18**Complete if Known**

Application Number	10/615,927
Filing Date	July 10, 2003
First Named Inventor	Louis B. Rosenberg
Art Unit	2675
Examiner Name	Unassigned
Attorney Docket Number	IMMR106/01US

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		Number Kind Code ² (if known)			
		5,526,480	06/1996	Gibson	
		5,530,455	06/1996	Gillick et al.	
		5,547,382	08/20/1996	Yamasaki	
		5,550,562	08/27/1996	Aoki et al.	
		5,551,701	09/03/1996	Bouton et al.	
		5,565,840	10/1996	Thomer et al.	
		5,565,887	10/1996	McCambridge et al.	
		5,565,888	10/1996	Selker	
		5,570,111	10/1996	Barrett et al.	
		5,576,727	11/19/1996	Rosenberg et al.	
		5,577,981	11/20/1996	Jarvik	
		5,583,407	12/1996	Yamaguchi	
		5,583,478	12/1996	Renzl	
		5,586,257	12/17/1996	Perlman	
		5,587,937	12/24/1996	Massie et al.	
		5,589,828	12/31/1996	Armstrong	
		5,589,854	12/31/1996	Tsai	
		5,591,924	01/1997	Hilton	
		5,596,347	01/1997	Robertson et al.	
		5,619,180	04/1997	Massimino et al.	
		5,623,582	04/22/1997	Rosenberg	
		5,623,642	04/22/1997	Katz et al.	
		5,625,576	04/29/1997	Massie et al.	
		5,629,594	05/1997	Jacobus et al.	
		5,629,597	05/1997	Jacobus, et al.	
		5,631,861	05/1997	Kramer	
		5,642,469	06/24/1997	Hannaford et al.	
		5,643,087	07/01/1997	Marcus et al.	
		5,656,981	08/1997	Kurita	
		5,660,138	09/09/1997	Culver	
		5,666,473	09/09/1997	Wallace	
		5,690,582	11/25/1997	Ulrich et al.	
		5,691,747	11/1997	Amano	
		5,691,898	11/25/1997	Rosenberg et al.	

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Sheet 8 of 18

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Application Number	10/615,927
Filing Date	July 10, 2003
First Named Inventor	Louis B. Rosenberg
Art Unit	2675
Examiner Name	Unassigned
Attorney Docket Number	IMMR106/01US

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		Number Kind Code ² (if known)			
		5,694,013	12/02/1997	Stewart et al.	
		5,701,140	12/1997	Rosenberg et al.	
		5,709,219	01/20/1998	Chen et al.	
		5,714,978	02/03/1998	Yamanaka et al.	
		5,721,566	02/24/1998	Rosenberg et al.	
		5,724,068	03/1998	Sanchez et al.	
		5,731,804	03/1998	Rosenberg	
		5,734,373	03/31/1998	Rosenberg et al.	
		5,736,978	04/07/1998	Hasser et al.	
		5,739,811	04/1998	Rosenberg et al.	
		5,742,278	04/21/1998	Chen et al.	
		5,745,715	04/1998	Pickover et al.	
		5,754,023	05/19/1998	Roston et al.	
		5,755,577	05/26/1998	Gillo	
		5,757,358	05/1998	Osga	
		5,760,764	06/1998	Martinelli	
		5,766,016	06/16/1998	Sinclair	
		5,767,839	06/16/1998	Rosenberg	
		5,769,640	06/23/1998	Jacobus et al.	
		5,771,037	06/23/1998	Jackson	
		5,781,172	07/14/1998	Engel et al.	
		5,784,052	07/1998	Keyson	
		5,785,630	07/28/1998	Bobick et al.	
		5,786,818	07/1998	Brewer et al.	
		5,790,108	08/04/1998	Salcudean et al.	
		5,791,992	08/11/1998	Crump et al.	
		5,802,353	09/01/1998	Avila et al.	
		5,805,140	09/08/1998	Rosenberg et al.	
		5,805,155	09/1998	Thorne, III et al.	
		5,808,601	09/1998	Leah et al.	
		5,818,423	10/1998	Pugliese et al.	
		5,825,308	10/1998	Rosenberg	
		5,831,408	11/03/1998	Jacobus et al.	
		5,844,392	12/01/1998	Peurach et al.	

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Sheet 9 of 18

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Application Number	10/615,927
Filing Date	July 10, 2003
First Named Inventor	Louis B. Rosenberg
Art Unit	2675
Examiner Name	Unassigned
Attorney Docket Number	IMMR106/01US

U.S. PATENT DOCUMENTS

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		Number	Kind Code ² (if known)			
		5,877,748		03/1999	Redlich	
		5,880,714		03/1999	Rosenberg et al.	
		5,884,029		03/16/1999	Brush, II et al.	
		5,889,670		03/30/1999	Schuler et al.	
		5,889,672		03/1999	Schuler et al.	
		5,956,484		09/21/1999	Rosenberg et al.	
		5,990,869		11/23/1999	Kubica et al.	
		6,004,134		12/21/1999	Marcus et al.	
		6,020,876		02/2000	Rosenberg et al.	
		6,028,593		02/2000	Rosenberg et al.	
		6,057,828		05/2000	Rosenberg et al.	
		6,061,004		05/2000	Rosenberg	
		6,078,308		06/2000	Rosenberg et al.	
		6,088,017		07/11/2000	Tremblay et al.	
		6,088,019		07/2000	Rosenberg	
		6,101,530		08/08/2000	Rosenberg et al.	
		6,111,577		08/29/2000	Zilles et al.	
		6,125,385		09/26/2000	Wies et al.	
		6,131,097		10/10/2000	Peurach et al.	
		6,161,126		12/12/2000	Wies et al.	
		6,162,123		12/2000	Woolston	
		6,422,941		07/23/2002	Thorne et al.	

Examiner Initials*	Cite No. ¹	Foreign Patent Document			Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Country Code ³	Number ⁴	Kind Code ⁵ (if known)			
		WO	WO9520788		08/03/1995		
		WO	WO9502801		01/26/1995		
		UK	2254911A		10/21/1992		
		WO	WO9622591		07/25/1996		
		WO	WO9616397		05/30/1996		
		EP	0085518 A1		08/10/1983		
		WO	WO9642078		12/27/1996		
		WO	WO9532459		11/30/1995		
		WO	WO9712337		04/03/1997		

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Sheet **10** of **18****Complete if Known**

Application Number	10/615,927
Filing Date	July 10, 2003
First Named Inventor	Louis B. Rosenberg
Art Unit	2675
Examiner Name	Unassigned
Attorney Docket Number	IMMR106/01US

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		Country Code ²	Number ⁴	Kind Code ⁵ (if known)			
		WO	WO9712357		04/03/1997		
		WO	WO9719440		05/25/1997		
		WO	WO9731333		08/28/1997		
		WO	WO9721160		06/12/1997		
		EP	0265011	A1	04/1988		
		EP	0607580	A1	07/1994		
		EP	0626634		05/1994		
		WO	WO9520787		08/1995		
		WO	WO9502233		01/1995		
		WO	WO9510080		04/1995		
		Japan	4-34610		02/1992		
		EP	EP0349086		01/03/1990		

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Sheet **11** of **18****Complete if Known**

Application Number	10/615,927
Filing Date	July 10, 2003
First Named Inventor	Louis B. Rosenberg
Art Unit	2675
Examiner Name	Unassigned
Attorney Docket Number	IMMR106/01US

OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS

Examiner Initials *	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
		"Foot-Operated Mouse," IBM Technical Disclosure Bulletin, Apr. 1986, vol. 28, No. 71.
		"High Performance Model of the Immersion Probe," Immersion-Probe-MD™, Immersion Human Interface Corporation.
		"Proceedings of the IFIP Congress 65," International Federation for Information Processing, Information Processing 1965, vol. 3, New York, May 24-29, pp. 506.
		"The Personal Digitizer™," Immersion Human Interface Corporation 1994.
		"Useful Technology for Your Idea File," Design News, Mar. 7 1994, pp. 63.
		3D Human Interface Tool, Immersion Probe™, Immersion Human Interface Corporation 1994.
		SLOCUM, Precision Machine Design, , Prentice Hall, pp. 661, 664.
		Cursor Walso, "Designer's Corner-Useful Technology for Your Idea File." Design News, Mar. 7, 1993, p. 63
		IBM Technical Disclosure Bulletin, "Mouse Ball-Actuating Device With Force and Tactile Feedback," Vol. 32, No. 9B, February 1990.
		ADACHI, YOSHITAKA et al., "Sensory Evaluation of Virtual Push-Buttons," Technical Research Center, Suzuki Motor Corporation, November 1994.
		ADELSTEIN, "A Virtual Environment System For The Study of Human Arm Tremor," Ph.D. Dissertation, Dept. of Mechanical Engineering, MIT, June 1989.
		ADELSTEIN, BERNARD D. et al., "A High Performance Two Degree-of-Freedom Kinesthetic Interface," Massachusetts Institute of Technology 1992, pp. 108-112.
		ADELSTEIN, BERNARD D. et al., "Design and Implementation of a Force Reflecting Manipulandum for Manual Control Research," 1992, pp. 1-24.
		AKAMATSU, M. et al., "Multimodal Mouse: A Mouse-Type Device with Tactile and Force Display," Presence, Vol. 3, No. 1, Winter 1994, pp. 73-80.
		ALBERS, F. GERRY, "Microcomputer Base for Control Loading," Naval Training Equipment Center 11 th NTEC-Industry Conference Proceedings, NAVTRAEEQUIPCENT IH-306, 1978.

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Sheet 12 of 18

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Application Number	10/615,927
Filing Date	July 10, 2003
First Named Inventor	Louis B. Rosenberg
Art Unit	2675
Examiner Name	Unassigned
Attorney Docket Number	IMMR106/01US

OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS

Examiner Initials *	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
		ANSLEY, D., "Thimble gets in touch with reality," New Scientist, 1994, p.19.
		ATKINSON, WILLIAM D. et al., "Computing with Feeling," Comput. & Graphics, vol. 2, No. 2-E, pp. 97-103.
		BAIGRIE, "Electric Control Loading - A Low Cost, High Performance Alternative," Proceedings, pp. 247-254, November 6-8, 1990.
		BATTER, JAMES J. et al., "Grobe-1: A Computer Display to the Sense of Feel," pp. TA-4-188-TA-4-192.
		BEJCZY, ANTAL K., "The Phantom Robot: Predictive Displays for Teleoperation with Time Delay," IEEE 1990, pp. 546-550.
		BEJCZY, "Sensors, Controls, and Man-Machine Interface for Advanced Teleoperation," Science, Vol. 208, No. 4450, pp. 1327-1335, 1980.
		BEJCZY, "Generalization of Bilateral Force-Reflecting Control of Manipulators," Proceedings of Fourth CISM-IFTOMM, Sep. 8-12, 1981.
		BEJCZY et al., "Kinesthetic Coupling Between Operator and Remote Manipulator," International Computer Technology Conference, The American Society of Mechanical Engineers, San Francisco, CA, August 12-15, 1980.
		BEJCZY et al., "A Laboratory Breadboard System For Dual-Arm Teleoperation," SOAR '89 Workshop, JSC, Houston, TX, July 25-27, 1989.
		BEJCZY, et al., "Tele-Virtual Reality of Dynamic Mechanical Model," Proceedings of the 1992 IEEE/RSJ International Conference on Intelligent Robots and Systems, Raleigh, NC, July 7-10, 1992.
		BROOKS, JR., F., et al., "Project GROPE-Haptic Displays for Scientific Visualization," Computer Graphics, vol. 24, Number 4, Aug., 1990, pp. 177-185.
		BROOKS et al., "Hand Controllers for Teleoperation - A State-of-the-Art Technology Survey and Evaluation," JPL Publication 85-11; NASA-CR-175890; N85-28559, pp. 1-84, 03/1/1985.
		BURDEA, GRIGORE et al., "A Portable Dextrous Master with Force Feedback," Presence: Teleoperators and Virtual Environments, MIT Press, June 1991.
		BURDEA, GRIGORE et al., "Distributed Virtual Force Feedback, Lecture Notes for Workshop on Force Display in Virtual Environments and Its Application to Robotic Teleoperation," 1993 IEEE International Conference on Robotics and Automation, May 2, 1993, pp. 25-44.
		BURDEA, GRIGORE, et al., "Dextrous Telerobotics with Force Feedback-An Overview," Robotica 1991, Vol. 9.

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Sheet **13** of **18****Complete if Known**

Application Number	10/615,927
Filing Date	July 10, 2003
First Named Inventor	Louis B. Rosenberg
Art Unit	2675
Examiner Name	Unassigned
Attorney Docket Number	IMMR106/01US

OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS

Examiner Initials *	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	
		BUTTOLO, PIETRO et al., "Pen-Based Force Display for Precision Manipulation in Virtual Environments," IEEE March 1995, pp. 1-8.	
		CALDWELL, et al., "Enhanced Tactile Feedback (Tele-Taction) Using a Multi-Functional Sensory System," 1050-4729/93, pp. 955-960, 1993.	
		COLGATE, J. EDWARD et al., "Implementation of Stiff Virtual Walls in Force-Reflecting Interfaces," September 22, 1993, pp. 1-9..	
		EBERHARDT et al., "OMAR – A Haptic display for speech perception by deaf and deaf-blind individuals," IEEE Virtual Reality Annual International Symposium, Seattle, WA, Sep. 18-22, 1993.	
		ELLIS, R.E. et al., "Design and Evaluation of a High-Performance Prototype Planar Haptic Interface," ASME December 3, 1993, DSC-Vol. 49, pp. 55-64.	
		FISCHER, PATRICK et al., "Specification and Design of Input Devices for Teleoperation," 1990.	
		FISHER, S.S. et al., "Virtual Environment Display System," ACM Interactive 3D Graphics, October, 1986.	
		GOSSWEILER et al., "An Introduced Tutorial for Developing Multi-User Virtual Environments," Presence: Teleoperators and Virtual Environments, MIT Press, 3(4), Fall 94 pp. 255-264.	
		GOTOW, J.K., et al., "Perception of Mechanical Properties at the Man-Machine Interface," IEEE 1987, pp. 688-689.	
		GOTOW et al., "Controlled Impedance Test Apparatus for Studying Human Interpretation of Kinesthetic Feedback," WA11-11:00, pp. 332-337.	
		HANNAFORD, B. et al., "Force Feedback Cursor Control," NASA Tech Brief, Vol. 13, No. 11, Item #21, 1989, pp. 1-4.	
		HANNAFORD, BLAKE et al., "Performance Evaluation of a Six-Axis Generalized Force-Reflecting Teleoperator," IEEE May/June 1991, Vol. 21, No. 3, pp. 620-633.	
		HASSER, CHRISTOPHER JOHN, "Tactile Feedback for a Force-Reflecting Haptic Display," The School of Engineering, University of Dayton, December 1995, pp. iii-xii & 1-96.	
		MERNDON, J.N. et al., "The State-of-the-Art Model M-2 Maintenance System," Proc. of the 1984 Natl Meeting on Robotics and Remote Handling in Hostile Environments, American Nuclear Society, 1984, pp. 59-65.	
		HIROTA, K., et al., "Development of Surface Display," IEEE 0-7803-1363-1, 1993, pp. 256-262.	
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		HOWE, ROBERT O., "Task Performance with a Dextrous Teleoperated Hand System," Proceedings of SPIE, November 1992, Vol. 1833, pp. 1-9.
		HOWE, "A Force-Reflecting Teleoperated Hand System for the Study of Tactile Sensing in Precision Manipulation," Proceedings of the 1992 IEEE International Conference on Robotics and Automation, Nice, France, May 1992.
		IWATA, HIROO et al., "Volume Adaptation," IEEE 1993, pp. 16-18.
		IWATA, HIROO, "Artificial Reality with Force-Feedback: Development of Desktop Virtual Space with Compact Master Manipulator," Computer Graphics, Vol. 24, No. 4, 1990, pp. 165-170.
		IWATA, HIROO, "Pen-based Haptic Virtual Environment," Institute of Engineering Mechanics, University of Tsukuba, Japan, pp. 287-292.
		JACOBSEN, S.C. et al., "High Performance, High Dexterity, Force Reflective Teleoperator II," ANS Topical Meeting on Robotics & Remote Systems, Albuquerque, New Mexico February 24-27, 1991, pp. 1-10.
		JONES, L.A., et al., "A Perceptual Analysis of Stiffness," Experimental Brain Research, Vol. 79, No. 1, pp. 150-156, 1990.
		KELLEY, A. J. et al., "MagicMouse: Tactile and Kinesthetic Feedback in the Human-Computer Interface using an Electromagnetically Actuated Input/Output Device," Dept. of Elec. Eng., Univ. of Brit. Columbia, 1993, pp. 1-27.
		KELLEY, A. J. et al., "On the Development of a Force-Feedback Mouse and Its Integration into a Graphical User Interface," Symp. On Haptic Interfaces for Virtual Environment and Teleoperator Systems, 1994 Int'l Mechanical Engineering Congress and Exhibition, Chicago, IL, Nov. 1994, pp. 1-8.
		KILPATRICK, P., "The use of a Kinesthetic Supplement in an Interactive Graphics System," University of North Carolina, 1976, pp. 1-176.
		KIM, WON S. et al., "A Teleoperation Training Simulator with Visual and Kinesthetic Force Virtual Reality."
		KIM, WON S. et al., "Graphics Displays for Operator Aid in Telemanipulation," IEEE 1991, pp. 1059-1067.
		KONTARINIS et al., "Display of High-Frequency Tactile Information to Teleoperators," Telemanipulator Technology and Space Telerobotics, Won S. Kim, Editor, Proc. SPIE Vol. 2057, pp. 40-50, Sep. 7-9, 1993.
		KOTOKU, TETSUO et al., "Environment Modeling for the Interactive Display (EMID) Used in Telerobotic Systems," IEEE November 3-5, 1991, pp. 99-1004.
		KOTOKU, TETSUO, "A Predictive Display with Force Feedback and its Application to Remote Manipulation System with Transmission Time Display," IEEE 1992, 1992, pp. 239-246.

Examiner
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		KRISHNA ROY, "Virtual Presence Takes Surgeons through the Virtual Keyhole to Hone Their Skills", Business & Industry, Jul. 4, 1993.
		KRUEGER, MYRON W., Artificial Reality 1988, pp. 54-75.
		McAFFEE, DOUGLAS A., "Teleoperator System/Telerobot Demonstrator: Force Reflecting Hand Controller Equipment Manual," JPL D-5172, pp. 1-50, A1-A36, B1-B5, C1-C36, January 1988.
		MARCUS, "Touch Feedback in Surgery," Proceedings of Virtual Reality and Medicine The Cutting Edge, Sep. 8-11, 1994.
		MEYER, KENNETH et al., "A Survey of Position Trackers," The Massachusetts Institute of Technology 1992, Presence, vol. 1, No. 2.
		MILLMAN, P. et al., "Design of a Four-Degree-of-Freedom Force-Reflecting Manipulandum with a Specified Force/Torque Workspace," IEEE CH2969-4, 1991, pp. 1488-1493.
		MINSKY, MARGARET et al., "Feeling and Seeing: Issues in Force Display," ACM 1990, pp. 235-242.
		MINSKY, "Computational Haptics: The Sandpaper System for Synthesizing Texture for a Force-Feedback Display," Ph.D. Dissertation, MIT, June 1995.
		MUNCH, S. et al., "Intelligent Control for Haptic Displays," Eurographics '96, Vol. 15, No. 3, Eurographics Association, 1996, pp. C217-C226.
		NOLL, A. MICHAEL, "Man-Machine Tactile Communication Dissertation," Polytechnic Institute of Brooklyn, June 1971, pp. 1-88.
		NOLL, "Man-Machine Tactile," SID Journal, July/August 1972 Issue.
		OUH-YOUNG, MING et al., "Creating an Illusion of Feel: Control Issues In Force Display," University of North Carolina, 1989, pp. 1-14.
		OUH-YOUNG, MING et al., "Force Display Performs Better than Visual Display In a Simple 6-D Docking Task," IEEE 1989, pp. 1462-1466.
		OUH-YOUNG, MING et al., "Using a Manipulator for Force Display in Molecular Docking," IEEE 1988, pp. 1824-1829.
		OUH-YOUNG, MING, "Force Display in Molecular Docking," Chapel Hill 1990, p. 1-369.

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		OUH-YOUNG, "A Low-Cost Force Feedback Joystick and Its Use In PC Video Games," IEEE Transactions on Consumer Electronics, Vol. 41, No. 3, August 1995.
		PATRICK et al., "Design and Testing of a Non-reactive, Fingertip, Tactile Display for Interaction with Remote Environments," Cooperative Intelligent Robotics in Space, Rui J. deFigueiredo et al., Editor, Proc. SPIE Vol. 1387, pp. 215-222, 1990.
		PAYETTE, J. et al., "Evaluation of a Force Feedback (Haptic) Computer Pointing Device in Zero Gravity," DSC-Vol. 58, Proc. of ASME Dynamics Systems, ASME 1996, pp. 547-553.
		RABINOWITZ et al., "Multidimensional tactile displays: Identification of vibratory intensity, frequency, and contactor area," Journal of The Acoustical Society of America, Vol. 82, No. 4, October 1987.
		RAMSTEIN et al., "The Pantograph: A large Workspace Haptic Device for a Multimodal Human-Computer Interaction," Computer-Human Interaction, CHI '94, pp. 1-3.
		RAMSTEIN, C., "Combining Haptic and Braille Technologies: Design Issues and Pilot Study," ASSETS '96, ACM 0-89791-776-6, 1996, pp. 37-44.
		REPPERGER, D.W., "Active Force Reflection Devices in Teleoperation," IEEE Control Systems.
		ROSENBERG, LOUIS, Ph.D., "Using Force Feedback to Enhance Human performance in Graphical User Interfaces," Apr. 1996.
		ROSENBERG et al., "Commercially Viable Force Feedback Controller for Individuals with Neuromotor Disabilities," Crew Systems Directorate, AFMCF-TR-1997-0016, 1996, pp. 1-33.
		ROSENBERG et al., "The Use of force feedback to enhance graphical user interfaces," Stereoscopic Displays and Virtual Reality Systems III, 1996, pp. 243-248.
		ROSENBERG, L., "Virtual Fixtures: Perceptual Overlays Enhance Operator Performance in Telepresence Tasks", Stanford University, Jun. 1994, pp. 1-214.
		ROSENBERG, LOUIS B. et al. "Perceptual Decomposition of Virtual Haptic Surfaces," IEEE, October 1993.
		ROSENBERG, LOUIS B., "Perceptual Design of a Virtual Rigid Surface Contact," Center for Design Research Stanford University, Air Force Material Command, April 1993, pp. 1-41.
		ROSENBERG, LOUIS B., "The Use of Virtual Fixtures as Perceptual Overlays to Enhance Operator Performance in Remote Environments," Air Force Material Command, September 1992, pp. 1-42.
		ROSENBERG, LOUIS B., "The Use of Virtual Fixtures to Enhance Operator Performance in Time Delayed Teleoperation," Armstrong Laboratory, March 1993, pp. 1-45.
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		ROSENBERG, LOUIS B., "Virtual Fixtures as Tools to Enhance Operator Performance in Telepresence Environments," SPIE Telemanipulator Technology, 1993.
		ROSENBERG, LOUIS B., "Virtual Haptic Overlays Enhance Performance in Telepresence Tasks," SPIE, 1994.
		ROSENBERG, LOUIS B., "Crew Systems Directorate Biodynamics and Biocommunications Division Wright-Patterson, Air Force Material Command, Mar. 1993, pp. 1-45.
		RUSSO, MASSIMO ANDREA, "The Design and Implementation of a Three Degree-of-Freedom Force Output Joystick," Department of Mechanical Engineering, May 11, 1990, pp. 9-40 & 96 & 97.
		RUSSO, "Controlling Dissipative Magnetic Particle Brakes in Force Reflective Devices," DSC-Vol. 42, Advances in Robotics, pp. 63-70, ASME 1992.
		SCHMILT, BRIAN et al., "Application Areas for a Force-Feedback Joystick," ASME 1993, DSC-Vol. 49, pp. 47-54.
		SHIMOGA, "Finger Force and Touch Feedback Issues in Dexterous Telemanipulation," Proceedings of Fourth Annual Conference on Intelligent Robotic Systems for Space Exploration, Rensselaer Polytechnic Institute, Sep. 30 – Oct. 1, 1992.
		SMITH, GEOFFREY, "Call It Palpable Progress," Business Week, Oct. 9, 1995, p. 93, 96.
		SNOW, et al., "Model-X Force-Reflecting-Hand-Controller," NT Control No. MPO-17851; JPL Case No. 5348, pp. 1-4, 06/15/1989.
		SNOW, E. et al., "Compact Force-Reflecting Hand Controller," JPL, Apr. 1991, vol. 15, No. 3, Item No. 153, pp. 1-15a.
		STANLEY et al., "Computer Simulation of Interacting Dynamic Mechanical Systems Using Distributed Memory Parallel Processors," DSC-Vol. 42, Advances in Robotics, pp. 55-61, ASME 1992.
		SU, S. AUGUSTINE et al., "The Virtual Panel Architecture: A 3D Gesture Framework," IEEE 1993, pp. 387-393.
		TADROS, "Control System Design for a Three Degree of Freedom Virtual Environment Simulator Using Motor/Brake Pair Actuators, MIT Archive, pp. 1-88, February 1990.
		TAN, HONG Z. et al., "Manual Resolution of Compliance When Work and Force Cues are Minimized," ASME 1993, DSC-vol. 49, pp. 99-104.
		TAN, HONG Z. et al., "Human Factors for the Design of Force-Reflecting Haptic Interfaces," Tan, Srinivasan, Eberman, & Chang, ASME WAM 1994, pp. 1-11.

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		TAVKHELIDZE, D.S. "Kinematic Analysis of Five-Link Spherical Mechanisms, Mechanism and Machine Theory 1974, vol. 9, pp. 187-190.	
		TERRY et al., "Tactile Feedback In A Computer Mouse," Proceedings of Fourteenth Annual Northeast Bioengineering Conference, University of New Hampshire, March 10-11, 1988.	
		WIKER, S. et al., "Development of Tactile Mice for Blind Access to Computers: Importance of Stimulation Locus, Object Size, and Vibrotactile Display Resolution," Proc. of the Human Factors Society 35 th Annual Meeting 1991, pp. 708-712.	
		WINEY III, C. ALVIN MCCOY, "Computer Simulated Visual and Tactile Feedback as an Aid to Manipulator and Vehicle Control," Mstr of Science In Mechanical Engineering, MIT Jun. 1981, pp. 1-80.	
		YAMAKITA, M. et al., "Tele-Virtual Reality of Dynamic Mechanical Model, Proceedings of the 1992 IEEE/RSJ International Conference on Intelligent Robots and Systems, Raleigh, NC, July 7-10, 1992, pp. 1103-1110.	
		YOKOKOHJI et al., "What You Can See is What You Can Feel - Development of a Visual/Haptic Interface to Virtual Environment," Proceedings of VRAIS '96, IEEE 1996, pp. 46-54.	

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U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No. ¹	U.S. Patent Document		Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY
		Number	Kind Code ² (if known)		
	A1	3,157,853		Hirsch	11-17-1964
	A2	3,220,121		Cutler	11-30-1995
	A3	3,497,668		Hirsch	02-25-1973
	A4	3,517,446		Corlyon et al.	06-30-1970
	A5	3,902,687		Hightower	06-25-1973
	A6	3,903,614		Diamond et al.	09-09-1975
	A7	3,919,691		Noll	11-11-1975
	A8	3,923,166		Fletcher et al.	12-02-1975
	A9	4,125,800		Jones	11-14-1978
	A10	4,160,508		Salsbury	07-10-1979
	A11	4,236,325		Hall et al.	10-02-1980
	A12	4,398,889		Lam et al.	08-16-1983
	A13	4,513,235		Acklam et al.	04-23-1985
	A14	4,581,491		Boothroyd	04-08-1986
	A15	4,599,070		Hladky et al.	07-08-1986
	A16	4,603,284		Perzley	07-29-1986
	A17	4,632,341		Repperger et al.	12-30-1986
	A18	4,654,648		Herrington et al.	03-31-1987
	A19	4,689,449		Rosen	08-25-1987
	A20	4,708,656		DeVries et al.	11-24-1987
	A21	4,713,007		Alban	12-15-1987
	A22	4,795,296		Jau	01-03-1989
	A23	4,800,721		Comenska et al.	01-31-1989
	A24	4,823,634		Culver	04-25-1989
	A25	4,839,838		LaBabe et al.	06-13-1989
	A26	4,853,874		Iwamoto et al.	08-01-1989
	A27	4,868,549		Affinito et al.	09-19-1989
	A28	4,888,538		Dimitrov et al.	12-19-1989
	A29	4,891,764		McIntosh	01-02-1990
	A30	4,907,970		Meenen, Jr.	03-13-1990
	A31	4,930,776		Baker	06-05-1990
	A32	4,934,694		McIntosh	06-19-1990
	A33	4,975,728		Kley	06-19-1990
	A34	4,942,538		Yuan et al.	07-17-1990
	A35	4,949,119		Moncrief et al.	08-14-1990
	A36	4,961,138		Gorniak	10-02-1990
	A37	5,007,085		Greanias et al.	04-09-1991
	A38	5,007,300		Siva	04-16-1991
	A39	5,018,922		Yoshinada et al.	05-28-1991
	A40	5,019,761		Kraft	05-28-1991
	A41	5,022,407		Horch et al.	06-11-1991
	A42	5,035,242		Franklin	07-30-1991
	A43	5,038,089		Szakaly	08-06-1991
	A44	5,044,956		Behensky et al.	09-03-1991
	A45	5,050,608		Watanabe et al.	09-24-1991
	A46	5,072,361		Davis et al.	12-10-1991
	A47	5,078,152		Bond	01-07-1992
	A48	5,080,377		Stamper et al.	01-14-1992

¹ Unique citation designation number.

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U.S. PATENT DOCUMENTS					
A49	5,103,404		McIntosh		04-07-1992
A50	5,107,080		Rosen		04-21-1992
A51	5,116,051		Moncrief et al.		05-26-1992
A52	5,128,671		Thomas, Jr.		07-07-1992
A53	5,132,672		Clark		07-21-1992
A54	5,139,261		Openiano		08-18-1992
A55	5,142,931		Menahem		09-01-1992
A56	5,143,905		Burdea et al.		09-01-1992
A57	5,146,568		Hollis, Jr. et al.		09-08-1992
A58	5,181,181		Glynn		01-19-1993
A59	5,184,319		Kramer		02-02-1993
A60	5,185,561		Good et al.		02-09-1993
A61	5,186,695		Mangseth et al.		02-16-1993
A62	5,193,963		McAffee et al.		03-16-1993
A63	5,212,473		Louis		05-18-1993
A64	5,220,260		Schuler		06-15-1993
A65	5,223,776		Radke et al.		06-29-1993
A66	5,230,623		Guthrie et al.		07-27-1993
A67	5,235,868		Culver		08-17-1993
A68	5,240,417		Smithson et al.		08-31-1993
A69	5,243,266		Kasagami et al.		09-07-1993
A70	5,264,768		Gregory et al.		11-23-1993
A71	5,266,875		Slotine et al.		11-30-1993
A72	5,271,290		Fischer		12-21-1993
A73	5,275,174		Cook		01-04-1994
A74	5,275,565		Moncrief		01-04-1994
A75	5,289,273		Lang		02-22-1994
A76	5,299,810		Pierce		04-05-1994
A77	5,309,140		Everett		05-03-1994
A78	5,334,027		Wherlock		08-02-1994
A79	5,341,459		Rackes		08-23-1994
A80	5,354,162		Burdea et al.		10-11-1994
A81	5,389,865		Jacobus et al.		02-14-1995
A82	5,396,266		Brimhall		03-07-1995
A83	5,396,267		Bouton		03-07-1995
A84	5,405,152		Katanics et al.		04-11-1995
A85	5,414,337		Schuler		05-09-1995
A86	5,428,748		Davidson et al.		06-27-1995
A87	5,428,140		Burdea et al.		07-04-1995
A88	5,435,554		Lipson		07-25-1995
A89	5,436,542		Petelin et al.		07-25-1995
A90	5,436,638		Bolas et al.		07-25-1995
A91	5,451,924		Massimino et al.		09-19-1995
A92	5,459,382		Jacobus et al.		10-17-1995
A93	5,466,213		Hogan		11-14-1995
A94	5,512,919		Araki		04-30-1996
A95	5,513,100		Parker et al.		04-30-1996
A96	5,547,382		Yamasaki		08-20-1996
A97	5,550,562		Aoki et al.		08-27-1996
A98	5,551,701		Bouton et al.		09-03-1996
A99	5,576,727		Rosenberg et al.		11-19-1996
A100	5,577,981		Jarvik		11-26-1996
A101	5,586,257		Perlman		12-17-1996
A102	5,587,937		Massie et al.		12-24-1996
A103	5,589,828		Armstrong		12-31-1996
A104	5,589,854		Tsai		12-31-1996

Substitute for form 1449A/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Complete if Known

Application Number
Filing Date July 10, 2003
First Named Inventor Louis B. ROSENBERG
Group Art Unit
Examiner Name
Attorney Docket Number IMMR106/01US

U.S. PATENT DOCUMENTS

A105	5,623,582	Rosenberg	04-22-1997
A106	5,623,642	Katz et al.	04-22-1997
A107	5,625,576	Massie et al.	04-29-1997
A108	5,642,469	Hannaford et al.	06-24-1997
A109	5,643,087	Marcus et al.	07-01-1997
A110	5,666,138	Culver	09-09-1997
A111	5,666,473	Wallace	09-09-1997
A112	5,690,582	Ulrich et al.	11-25-1997
A113	5,691,898	Rosenberg et al.	11-25-1997
A114	5,694,013	Stewart et al.	12-02-1997
A115	5,709,219	Chen et al.	01-20-1998
A116	5,714,978	Yamanaka et al.	02-03-1998
A117	5,721,566	Rosenberg et al.	02-24-1998
A118	5,734,373	Rosenberg et al.	03-31-1998
A119	5,736,978	Hasler et al.	04-07-1998
A120	5,742,278	Chen et al.	04-21-1998
A121	5,754,023	Roston et al.	05-19-1998
A122	5,755,577	Gillo	05-26-1998
A123	5,766,016	Sinclair	06-16-1998
A124	5,767,839	Rosenberg	06-16-1998
A125	5,769,640	Jacobus et al.	06-23-1998
A126	5,771,037	Jackson	06-23-1998
A127	5,781,172	Engel et al.	07-14-1998
A128	5,785,630	Bobick et al.	07-28-1998
A129	5,790,108	Salcudean et al.	08-04-1998
A130	5,791,992	Crump et al.	08-11-1998
A131	5,802,353	Avila et al.	09-01-1998
A132	5,805,140	Rosenberg et al.	09-08-1998
A133	5,831,408	Jacobus	11-03-1998
A134	5,844,392	Peurach et al.	12-01-1998
A135	5,882,029	Brush II, et al.	03-16-1999
A136	5,889,670	Schuler et al.	03-30-1999
A137	5,956,484	Rosenberg et al.	09-21-1999
A138	5,990,869	Kubica et al.	11-23-1999
A139	6,004,134	Marcus et al.	12-21-1999
A140	6,088,017	Tremblay et al.	07-11-2000
A141	6,101,530	Rosenberg et al.	08-08-2000
A142	6,111,577	Zilles et al.	08-29-2000
A143	6,125,585	Wies et al.	09-26-2000
A144	6,171,097	Peurach et al.	10-10-2000
A145	6,161,126	Wies et al.	12-12-2000
A146	6,422,941	Thorner et al.	07-23-2002

Substitute for form 1449A/PTO		Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)		Application Number	
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FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No. ¹	Foreign Patent Document			Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY
		Office	Number ²	Kind Code ³ (if known)		
	B1	PCT	WO9520788			08-03-1995
	B2	PCT	WO9502801			01-26-1995
	B3	UK	225491A			10-21-1992
	B4	PCT	WO9622591			07-25-1996
	B5	PCT	WO9616397			05-30-1996
	B6	EPO	0085518 A1			08-10-1983
	B7	PCT	WO9642078			12-27-1996
	B8	PCT	WO9532459			11-30-1995
	B9	PCT	WO9712337			04-03-1997
	B10	PCT	WO9719440			05-25-1997
	B11	PCT	WO9731333			08-28-1997
	B12	PCT	WO9721160			06-12-1997
	B13	EP	EP0349086			01-31-1990

OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS					
Examiner Initials*	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, page(s), volume-issue number(s), publisher, city and/or country where published.			T ⁶
	C1	Jacobsen, S.C., et al., "High Performance, High Dexterity, Force Reflective Teleoperator II," ANS Topical Meeting on Robotics & Remote System," Albuquerque, New Mexico February 24-27, 1991, pp. 1-10.			
	C2	Kotoku, Tetsuo, et al., "Environment Modeling for the Interactive Display (EMID) Used in Telerobotic Systems," IEEE November 3-5, 1991, pp. 99-1004.			
	C3	Bejczy, Antal K., "The Phantom Robot: Predictive Displays for Teleoperation with Time Delay," IEEE 1990, pp. 546-550.			
	C4	Buttolo, Pietro, et al., "Pen-Based Force Display for Precision Manipulation in Virtual Environments," IEEE March 1995, pp. 1-8.			
	C5	Tan, Hong Z., et al., "Human Factors for the Design of Force-Reflecting Haptic Interfaces," Tan, Srinivasan, Eberman, & Chang, ASME WAM 1994, pp. 1-11.			
	C6	Ellis, R.E., et al., "Design and Evaluation of a High-Performance Prototype Planar Haptic Interface," ASME December 3, 1993, DSC-Vol. 49, pp. 55-64.			
	C7	Adelstein, Bernard D., et al., "A High Performance Two Degree-of-Freedom Kinesthetic Interface," Massachusetts Institute of Technology 1992, pp. 108-112.			
	C8	Colgate, J. Edward, et al., "Implementation of Stiff Virtual Walls in Force-Reflecting Interfaces," September 22, 1993.			
	C9	Iwata, Hiroo, et al., "Volume Haptization," IEEE 1993, pp. 16-18.			
	C10	Fischer, Patrick, et al., "Specification and Design of Input Devices for Teleoperation," 1990.			
	C11	Burdea, Grigore, et al., "Distributed Virtual Force Feedback," IEEE, May 2, 1993, pp. 25-44.			
	C12	Rosenberg, Louis B., "The Use of Virtual Fixtures as Perceptual Overlays to Enhance Operator Performance in Remote Environments," Air Force Material Command, September 1992, pp. 1-42.			

¹ Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3).

² For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document.

³ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible.

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Substitute for form 1449A/PTO		Complete if Known	
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		Examiner Name	
Sheet	5	of	8
		Attorney Docket Number	IMMR106/01US

OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS	
C13	Rosenberg, Louis B., "The Use of Virtual Fixtures to Enhance Operator Performance in Time Delayed Teleoperation, Armstrong Laboratory, March 1993, pp. 1-45.
C14	Rosenberg, Louis B., "Perceptual Design of a Virtual Rigid Surface Contact," Center for Design Research Stanford University, Air Force Material Command, April 1993, pp. 1-41.
C15	Rosenberg, Louis B., et al., "Perceptual Decomposition of Virtual Haptic Surfaces," IEEE, October 1993.
C16	Rosenberg, Louis B., "Virtual Fixtures as Tools to Enhance Operator Performance in Telepresence Environments," SPIE Telemanipulator Technology, 1993.
C17	Burdea, Grigore, et al., "Dextrous Telerobotics with Force Feedback-An Overview," Robotica 1991, Vol. 9.
C18	Colgate, J. Edward, et al., "Implementation of Stiff Virtual Walls in Force-Reflecting Interfaces," 1993, pp. 1-9.
C19	Yamakita, M., et al., "Tele-Virtual Reality of Dynamic Mechanical Model," IEEE July 7-10, 1992, pp. 1103-1110.
C20	Adelstein, Bernard D., et al., "Design and Implementation of a Force Reflecting Manipulandum for Manual Control Research," 1992, pp. 1-24.
C21	Ouh-Young, Ming, et al., "Force Display Performs Better than Visual Display in a Simple 6-D Docking Task," IEEE 1989, pp. 1462-1466.
C22	Kim, Won S., et al., "Graphics Displays for Operator Aid in Telemanipulation," IEEE 1991, pp. 1059-1067.
C23	Hannaford, Blake, et al., "Performance Evaluation of a Six-Axis Generalized Force-Reflecting Teleoperator," IEEE May/June 1991, Vol. 21, No. 3, pp. 620-633.
C24	Kim, Won S., et al., "A Teleoperation Training Simulator with Visual and Kinesthetic Force Virtual Reality."
C25	Burdea, Grigore, et al., "A Portable Dextrous Master with Force Feedback," Presence: Teleoperators and Virtual Environments, MIT Press, June 1991.
C26	Fisher, S.S., et al., "Virtual Environment Display System," ACM Interactive 3D Graphics, October 1986.
C27	Herndon, J.N., et al., "The State-of-the Art Model M-2 Maintenance System," Proc. of the 1984 Natl Meeting on Robotics and Remote Handling in Hostile Environments, American Nuclear Society, 1984, pp. 59-65.
C28	Minsky, Margaret, et al., "Feeling and Seeing: Issues in Force Display," ACM 1990, pp. 235-242.
C29	Batter, James J., et al., "Grobe-1: A Computer Display to the Sense of Feel," pp. TA-4-188-TA-4-192.
C30	Gotow, J.K., et al., "Perception of Mechanical Properties at the Man-Machine Interface," IEEE 1987, pp. 688-689.
C31	Atkinson, William D., et al., "Computing with Feeling," Comput. & Graphics, Vol. 2, No. 2-E, pp. 97-103.
C32	Noll, A. Michael, "Man-Machine Tactile Communication Dissertation," Polytechnic Institute of Brooklyn, June 1971, pp. 1-88.
C33	Ouh-Young, Ming, "Force Display in Molecular Docking," Chapel Hill 1990, pp. 1-85.
C34	Ouh-Young, Ming, et al., "Using a Manipulator for Force Display in Molecular Docking," IEEE 1988, pp. 1824-1829.
C35	Wiker, S., et al., "Development of Tactile Mice for Blind Access to Computers: Importance of Stimulation Locus, Object Size, and Vibrotactile Display Resolution," Proc. Of the Human Factors Society 35th Annual Meeting 1991, pp. 708-712.
C36	Adachi, Yoshitaka, et al., "Sensory Evaluation of Virtual Haptic Push-Buttons," Technical Research Center, Suzuki Motor Corporation, November 1994.
C37	Su, S. Augustine, et al., "The Virtual Panel Architecture: A 3D Gesture Framework," IEEE 1993, pp. 387-393.
C38	Tan, Hong Z., et al., "Manual Resolution of Compliance When Work and Force Cues are Minimized," ASME 1993, DSC-Vol. 49, pp. 99-104.

Substitute for form 1449A/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)		<i>Complete if Known</i>			
		Application Number			
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		Group Art Unit			
Examiner Name					
Sheet	6	of	8	Attorney Docket Number	IMMR106/01US

OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS		
C39	Iwata, Hiroo, "Pen-based Haptic Virtual Environment," Institute of Engineering Mechanics, University of Tsukuba, Japan, pp. 287-292.	
C40	Kotoku, Tetsuo, "A Predictive Display with Force Feedback and its Application to Remote Manipulation System with Transmission Time Delay," IEEE 1992, pp. 239-246.	
C41	Howe, Robert D., "Task Performance with a Dextrous Teleoperated Hand System," Proceedings of SPIE, November 1992, Vol. 1833, pp. 1-9.	
C42	Schmult, Brian, et al., "Application Areas for a Force-Feedback Joystick," ASME 1993, DSC-Vol. 49, pp. 47-54.	
C43	Hasser, Christopher John, "Tactile Feedback for a Force-Reflecting Haptic Display," The School of Engineering, University of Dayton, December 1995, pp. ii-xii & 1-96.	
C44	Russo, Massimo Andrea, "The Design and Implementation of a Three Degree-of-Freedom Force Output Joystick," Department of Mechanical Engineering, May 11, 1990, pp. 9-40 & 96 & 97.	
C45	Jones, L.A., et al., "A Perceptual Analysis of Stiffness," ExperimBrain Research 1990, pp. 151-156.	
C46	Kelley, A.J., et al., "MagicMouse: Tactile and Kinesthetic Feedback in the Human-Computer Interface using an Electromagnetically Actuated Input/Output Device," Dept. of Elec. Eng., Univ. of Brit. Columbia, 1993, pp. 1-27.	
C47	Kelley, A.J., et al., "On the Development of a Force-Feedback Mouse and Its Integration into a Graphical User Interface," Symp. On Haptic Interfaces for Virtual Environment and Teleoperator Systems, 1994 Int'l Mechanical Engineering Congress and Exhibition, 1994, pp. 1-8.	
C48	Ramstein, C., "Combining Haptic and Braille Technologies: Design Issues and Pilot Study," ASSETS '96, ACM 0-89791-776-6, 1996, pp. 37-44.	
C49	Akamatsu, M., et al., "Multimodal Mouse: A Mouse-Type Device with Tactile and Force Display," Presence, Vol. 3, No. 1, 1994, pp. 73-80.	
C50	Munch, S., et al., "Intelligent Control for Haptic Displays," Eurographics '96, Vol. 15, No. 3, Eurographics Association, 1996, pp. C217-C226.	
C51	Payette, J., et al., "Evaluation of a Force Feedback (Haptic) Computer Pointing Device in Zero Gravity," DSC-Vol. 58, Proc. Of ASME Dynamics Systems, ASME 1996, pp. 547-553.	
C52	Hannaford, B., et al., "Force Feedback Cursor Control," NASA Tech Brief, Vol. 13, No. 11, Item #21, 1989, pp. 1-4.	
C53	Rosenberg et al., "Commercially Viable Force Feedback Controller for Individuals with Neuromotor Disabilities," Crew Systems Directorate, AL/CF-TB-1997-0016, 1996, pp. 1-33.	
C54	Millman, P., et al., "Design of a Four Degree-of-Freedom Force-Reflecting Manipulandum with a Specified Force/Torque Workspace," IEEE CH2969-4, 1991, pp. 1488-1492.	
C55	Ramstein et al., "The Pantograph: A Large Workspace Haptic Device for a Multimodal Human Computer Interaction," Computer-Human Interaction, CHI'94, 1994, pp. 1-3.	
C56	Rosenberg et al., "The Use of Force Feedback to Enhance Graphical User Interfaces," Stereoscopic Displays and Virtual Reality Systems III, 1996, pp. 243-248.	
C57	Winey III, G., "Computer Simulated Visual and Tactile Feedback as an Aid to Manipulator and Vehicle Control," MIT 1981, pp. 1-79.	
C58	Yokokuboji et al., "What You can See is What you Can Feel-Development of a Visual/Haptic Interface to Virtual Environment," IEEE 0-8186-7295-1, 1996, pp. 46-54.	
C59	Brooks, Jr., F., et al., "Project GROPE-Haptic Displays for Scientific Visualization," ACM-0-89791-344-2, 1990, pp. 177-185.	
C60	Kilpatrick, P., "The Use of a Kinesthetic Supplement in an Interactive Graphics System," University of North Carolina, 1976, pp. 1-175.	
C61	Ming Ouh-Young, et al., "Creating an Illusion of Feel: Control Issues in Force Display," University of North Carolina, 1989, pp. 1-14.	
C62	Hirota, K., et al., "Development of Surface Display," IEEE 0-7803-1363-1, 1993, pp. 256-262	
C63	Iwata, Hiroo, "Artificial Reality with Force-Feedback: Development of Desktop Virtual Space with Compact Master Manipulator," Computer Graphics, Vol. 24, No. 4, 1990, pp. 165-170.	
C64	Brooks et al., "Project GROPE-Haptic Displays for Scientific Visualization," Computer Graphics, Vol. 24, No. 4, 1990, pp. 177-185.	

Substitute for form 1449A/PTO		Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)		Application Number	
		Filing Date	July 10, 2003
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		Group Art Unit	
		Examiner Name	
Sheet 7 of 8	Attorney Docket Number	IMMR106/01US	

OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS	
C65	Albers, F. Gerry, "Microcomputer Base for Control Loading," Naval Training Equipment Center 11 th NTEC-Industry Conference Proceedings, NAVTRAEQUIPCEN IH-306, 1978.
C66	Bagrie, "Electric Control Loading - A Low Cost, High Performance Alternative," proceedings, pp. 247-254, November 6-8, 1990.
C67	Russo, "The Design and Implementation of a Three Degree of Freedom Force Output Joystick," MIT Libraries Archives 08/14/1990, pp. 1-131, May 1990.
C68	Brooks et al., "Hand Controllers for Teleoperation - A State-of-the-Art Technology Survey and Evaluation," JPL Publication 85-11; NASA-CR-175890; N85-28559, pp. 1-84, 03/11/1985.
C69	Jones et al., "A perceptual analysis of stiffness," ISSN 0014-4819 Springer International (Springer-Verlag); Experimental Brain Research, Vol. 79, No. 1, pp. 150-156, 1990.
C70	Burdea et al., "Distributed Virtual Force Feedback, Lecture Notes for Workshop on Force Display in Virtual Environments and its Application to Robotic Teleoperation," 1993 IEEE International Conference on Robotics and Automation, pp. 25-44, 05/02/1993.
C71	Snow et al., "Model-X Force Reflecting-hand-Controller," NT Control No. MPO-17851; JPL Case No. 5348, pp. 1-4, 06/15/1989.
C72	Ouh-Young, "Force Display in Molecular Docking," Order No. 9034744, p. 1-369, 1990.
C73	Tadros, "Control System Design for a Three Degree of Freedom Virtual Environment Simulator Using Motor/Brake Pair Actuators, MIT Archive © Massachusetts Institute of Technology, pp. 1-88, February 1990.
C74	Caldwell et al., "Enhanced Tactile Feedback (Tele-Taction) Using a Multi-Functional Sensory System," 1050-4729/93, pp. 955-960, 1993.
C75	Adelstein, "Design and Implementation of a Force Reflecting Manipulandum for Manual Control research," DSC-Vol. 42, Advances in Robotics, Edited by H. Kazerooni, pp. 1-12, 1992.
C76	Gotow et al., "Controlled Impedance Test Apparatus for Studying Human Interpretation of Kinesthetic Feedback," WA11-11:00, pp. 332-337.
C77	Stanley et al., "Computer Simulation of Interacting Dynamic Mechanical Systems Using Distributed Memory Parallel Processors," DSC-Vol. 42, Advances in Robotics, pp. 55-61, ASME 1992.
C78	Russo, "Controlling Dissipative Magnetic Particle Brakes in Force Reflective Devices," DSC-Vol. 42, Advances in Robotics, pp. 63-70, ASME 1992.
C79	Kontarinis et al., "Display of High-Frequency Tactile Information to Teleoperators," Telemanipulator Technology and Space Telerobotics, Won S. Kim, Editor, Proc. SPIE Vol. 2057, pp. 40-50, Sep. 7-9, 1993.
C80	Patrick et al., "Design and Testing of A Non-reactive, Fingertip, Tactile Display for Interaction with Remote Environments," Cooperative Intelligent Robotics in Space, Rui J. deFigueiredo et al., Editor, Proc. SPIE Vol. 1387, pp. 215-222, 1990.
C81	Adelstein, "A Virtual Environment System For The Study of Human Arm Tremor," Ph.D. Dissertation, Dept. of Mechanical Engineering, MIT, June 1989.
C82	Bejczy, "Sensors, Controls, and Man-Machine Interface for Advanced Teleoperation," Science, Vol. 208, No. 4450, pp. 1327-1335, 1980.
C83	Bejczy, "Generalization of Bilateral Force-Reflecting Control of Manipulators," Proceedings of Fourth CISM-IFTOMM, Sep. 8-12, 1981.
C84	McAfee, "Teleoperator Subsystem/Telerobot Demonstrator: Force Reflecting hand Controller Equipment Manual," JPL D-9172, pp. 1-50, A1-A36, B1-B5, C1-C36, January 1988.
C85	Minsky, "Computational Haptics: The Sandpaper System for Synthesizing Texture for a Force-Feedback Display," Ph.D. Dissertation, MIT, June 1995.
C86	Jacobsen et al., "High Performance, Dexterous Telerobotic Manipulator With Force Reflection," Intervention/ROV '91 Conference & Exposition, Hollywood, Florida, May 21-23, 1991.
C87	Shimoga, "Finger Force and Touch Feedback Issues in Dexterous Telemanipulation," Proceedings of Fourth Annual Conference on Intelligent Robotic Systems for Space Exploration, Rensselaer Polytechnic Institute, Sep. 30 - Oct. 1, 1992.
C88	IBM Technical Disclosure Bulletin, "Mouse Ball-Actuating Device With Force and Tactile Feedback," Vol. 32, No. 9B, February 1990.
C89	Terry et al., "Tactile Feedback In A Computer Mouse," Proceedings of Fourteenth Annual Northeast Bioengineering Conference, University of New Hampshire, March 10-11, 1988.

Substitute for form 1449A/PTO			<i>Complete if Known</i>		
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)			Application Number		
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			Group Art Unit		
			Examiner Name		
Sheet	8	of	8	Attorney Docket Number	IMMR106/01US

OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS		
C90	Howe, "A Force-Reflecting Teleoperated Hand System for the Study of Tactile Sensing in Precision Manipulation," Proceedings of the 1992 IEEE International Conference on Robotics and Automation, Nice, France, May 1992.	
C91	Eberhardt et al., "OMAR – A Haptic display for speech perception by deaf and deaf-blind individuals," IEEE Virtual Reality Annual International Symposium, Seattle, WA, Sep. 18-22, 1993.	
C92	Rabinovitz et al., "Multidimensional tactile displays: Identification of vibratory intensity, frequency, and contactor area," Journal of The Acoustical Society of America, Vol. 82, No. 4, October 1987.	
C93	Bejczy et al., "Kinesthetic Coupling Between Operator and Remote Manipulator," International Computer Technology Conference, The American Society of Mechanical Engineers, San Francisco, CA, August 12-15, 1980.	
C94	Bejczy et al., "A Laboratory Breadboard System for Dual-Arm Teleoperation," SOAR '89 Workshop, JSC, Houston, TX, July 25-27, 1989.	
C95	Ouh-Young, "A Low-Cost Force Feedback Joystick and Its Use in PC Video Games," IEEE Transactions on Consumer Electronics, Vol. 41, No. 3, August 1995.	
C96	Marcus, "Touch Feedback in Surgery," Proceedings of Virtual Reality and Medicine The Cutting Edge, Sep. 8-11, 1994.	
C97	Bejczy et al., "Universal Computer Control System (UCCS) For Space Teleoperators," CH2413-3/87/0000/0318501.00 1987 IEEE, 1987.	
C98	Yamakita et al., "Tele-Virtual Reality of Dynamic Mechanical Model," Proceedings of the 1992 IEEE/RSJ International Conference on Intelligent Robots and Systems, Raleigh, NC, July 7-10, 1992	
C99	NOLL, "Man-Machine Tactile," SID Journal, July/August 1972 Issue.	

Examiner Signature	Date Considered
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*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.